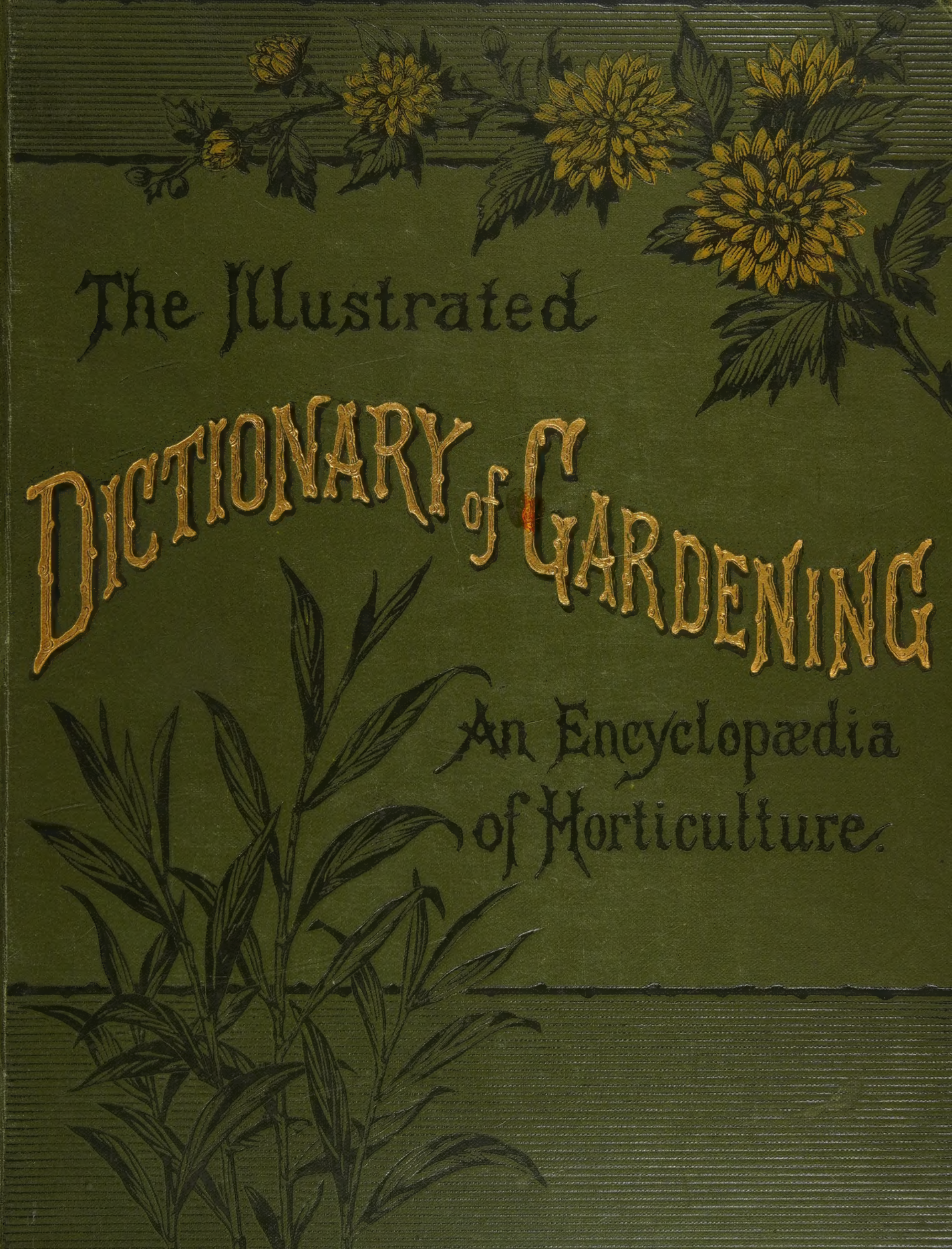
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An Encyclopædia
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THE

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A PRACTICAL AND SCIENTIFIC

Encyclopædia of Horticulture

FOR

GARDENERS AND BOTANISTS.

EDITED BY

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Vol. IV.—T to Z, and Supplement.

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REFERENCE TO ILLUSTRATIONS OF PLANTS OTHER THAN THOSE FIGURED IN THIS WORK.

IT has been suggested, by an eminent Authority, that many readers would be glad to be informed where reliable Illustrations could be found of those Plants which are not figured in this Work. To meet this want, references to the Figures in Standard Authorities have been given, the titles of the Works referred to being, for economy of space, abbreviated as follows:

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THE

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The following are the Abbreviations used:—*fl.* flowers; *fr.* fruit; *l.* leaves; *h.* height; *deg.* degrees; *rhiz.* rhizomes; *cau.* caudex; *sti.* stipes.

The Asterisks (*) indicate plants that are especially good or distinct.

TABEBUIA (said to be the native name in Brazil). ORD. *Bignoniaceæ*. A genus embracing nearly sixty species of stove, glabrous, pubescent, or villous, erect trees or shrubs, natives of tropical America. Flowers often ample, racemose or cymose; calyx tubular, at first closed, afterwards variously cut at apex; corolla tube elongated, straight or scarcely incurved; limb spreading, sub-bilabiate, of five rounded, nearly equal lobes; stamens four, didynamous. Capsules oblong or elongated, subterete. Leaves opposite or slightly scattered, simple (one-foliolate?), trifoliolate, or often digitately five to seven-foliolate; leaflets petiolulate, entire or toothed. Few of the species are in cultivation. They require precisely similar treatment to that recommended for **Tecoma** (under which these plants are sometimes included).

T. æsculifolia (Horse Chestnut-leaved). *fl.*, corolla orange-coloured, sub-campanulate, the three lower lobes marked with yellow spots; panicle terminal, sub-corymbose. June. *l.* digitate; leaflets seven, obovate-oblong, shortly acuminate, narrowed at base, membranous, pubescent above, canescent-tomentose beneath. Branchlets pubescent. *h.* 20ft. Mexico. Tree. SYN. *Bignonia æsculifolia.*

T. chrysantha (golden-flowered). This is the correct name of the plant described in this work as *Bignonia chrysantha.* SYN. *Tecoma chrysantha.*

T. leucoxyla (white-wooded). This is the correct name of the plant described in this work as *Bignonia pallida.* SYN. *Bignonia leucoxyla* (of Velloso).

T. serratifolia (serrate-leaved). *fl.*, corolla yellow, glabrous, 2in. to 2½in. long, narrowly infundibular; corymbs contracted. *l.* chartaceous, devoid of scales; leaflets five, 3in. to 5in. long, oblong-lanceolate, shortly acuminate, sub-entire. *h.* 20ft. West Indies, 1822. Tree. SYN. *Tecoma serratifolia.*

T. spectabilis (showy).* This is the correct name of the plant described in this work as *Bignonia spectabilis.* SYN. *Tecoma spectabilis* (F. d. S. 948).

TABERNÆMONTANA (named in honour of James Theodore Tabernæmontanus, of Heidelberg, a celebrated physician and botanist, who died in 1590). SYNS. *Pandaca, Reichardia* (of Dennstaedt). Including *Conopharyngia.* ORD. *Apocynaceæ.* A genus comprising about 110 species of stove, evergreen, often glabrous trees or shrubs, broadly dispersed over tropical regions. Flowers

Tabernæmontana—*continued.*

white or yellowish; calyx usually small, five-lobed or five-parted; corolla salver-shaped, the throat not scaly, the lobes contorted; anthers sagittate, very acute; cymes scarcely branched. Berries or follicles two, globose, oblong, ovoid, or recurved-reniform, smooth or three-ribbed. Leaves opposite, slender or coriaceous, penni-veined. The species, a select few of which are here described, are interesting plants. *T. utilis* (a species probably not in cultivation), when tapped, yields a copious supply of thick, sweet milk, resembling that of the cow in appearance, but in substance rather sticky, owing to the presence of caoutchouc. A mixture of loam, sand, and peat, is the most suitable soil for Tabernæmontanas. Young plants are obtainable by means of cuttings, inserted in sand, under a glass, in moist heat. Except where otherwise indicated, all the under-mentioned species are shrubs, having white flowers.

T. Amsonia (Amsonia). A synonym of *Amsonia Tabernæmontana.*

T. amygdalifolia (Almond-leaved). *fl.* highly odorous; corolla segments obovate, undulated, nearly equal to the tube; cymes dichotomous, one-third to half the length of the leaves. July. *l.* oval-lanceolate or obovate-oblong, acute at both ends, 2in. to 5in. long, shining; petioles ¼in. to ½in. long. *h.* 6ft. South America, 1780. (B. R. 338.)

T. Barteri (Barter's).* *fl.* 1in. long; corolla tube slightly dilated at base and apex, the segments oblong-obovate, obtuse, rather shorter than the tube; peduncles dichotomously branched, few-flowered, shorter than the leaves. Summer. *l.* oblong, attenuated at both ends, the upper ones 2in. to 3in. long, in unequal whorls; petioles dilated and slightly connate at base. Branches pale. *h.* 6ft. Western tropical Africa, 1870. (B. M. 5859.)

T. coronaria (crowned).* Adam's Apple; East Indian Rose Bay. *fl.* odorous at night; corolla tube ⅔in. long, the segments oblong, obtuse, rather longer than the tube; peduncles in pairs from the forks of the branches, erect, dichotomous, four to six-flowered. July. *l.* opposite, unequal, elliptic-oblong, acute at base, obtuse and acuminate at apex, 3in. to 4in. long, membranous. Branches dichotomous. *h.* 4ft. Native country unknown; cultivated throughout India. 1770. (B. R. 1064; L. B. C. 406.) There is a double-flowered form, *flore-pleno.* (B. M. 1865, under name of *Nerium coronarium.*)

T. densiflora (dense-flowered). A synonym of *Rauwolfia densiflora.*

Tabernæmontana—*continued.*

T. dichotoma (dichotomous). *fl.* slightly odorous, 1in. long; corolla segments slightly exceeding the tube; cymes terminal, dichotomously branched, many-flowered, nearly equalling the leaves; peduncles naked, 3in. to 6in. long. September. *l.* oblong, acute at base, obtuse at apex, 2½in. to 3in. long; petioles six to ten lines long, embraced by the sheath-like stipules. Branches terete. *h.* 6ft. India, 1840. (B. R. 1841, 53.) SYN. *Cerbera dichotoma* (L. B. C. 1516).

T. grandiflora (large-flowered). *fl.* yellow, inodorous; calyx lobes ⅜in. long, leafy, gland-bearing towards the base; corolla tube fourteen lines long, the lobes obovate, very obtuse, shorter; peduncles terminal, twice-forked, few-flowered. Summer. *l.* oval or elliptic-obovate, acute at base, long and acutely cuspidate at apex, 2in. to 4in. long, one in each pair smaller, glabrous. Branchlets dichotomous. *h.* 6ft. British Guiana and Venezuela, 1823. (B. M. 5226.)

T. gratissima (very sweet-scented). A synonym of *T. recurva.*

T. laurifolia (Laurel-leaved). *fl.* yellow; corolla lobes linear-oblong, shorter than the tube; cymes contracted; peduncle about as long as the petioles. May. *l.* oval or oval-oblong, 4in. to 8in. long, blunt at both ends. *h.* 10ft. West Indies, 1768. Stove shrub. (B. R. 716.)

TABLE MOUNTAIN PINE. *See* **Pinus pungens.**

TACAMAHAC. *See* **Populus balsamifera.**

TACCA (the Malay name). SYN. *Ataccia.* ORD. *Taccaceæ.* A genus comprising about nine species of stove, perennial herbs; three are natives of tropical America, and the rest inhabit various tropical regions. Berry (? always) indehiscent. Other characteristics those of the order (which *see*). The species best known to cultivators are here described. The tubers of *T. pinnatifida* contain a great deal of starch, known as South Sea Arrowroot, and largely employed as an article of diet throughout the tropics. A compost of loam, peat, and sand, is most suitable for the culture of these plants. They must be very sparingly watered while in a dormant state. Propagation may be effected by division of the roots.

T. artocarpifolia (Artocarpus-leaved). *fl.* very numerous, on pedicels 1in. to 3in. long, the sterile, pendulous ones filiform;

FIG. 1. UPPER PORTION OF SCAPE, WITH FRUITS, OF TACCA PINNATIFIDA.

T. longiflora (long-flowered). *fl.*, corolla tube very long, slightly swollen below the middle; peduncles lax, about three-flowered. Summer. *l.* oblong-elliptic, abruptly acuminate, acute at base; petioles dilated at base. Sierra Leone, 1849. Tree. (B. M. 4484; F. d. S. 534.)

T. longifolia (long-leaved). *fl.* ⅜in. long; corolla lobes obovate-oblong, reflexed, equalling the tube; cymes axillary, dichotomous, many-flowered, much shorter than the leaves; peduncles thick. July. *l.* sub-sessile, oblong, acuminate, long-narrowed at base, 6in. to 10in. long, 1½in. to 2½in. broad, membranous. *h.* 6ft. British Guiana, 1849.

T. recurva (recurved). *fl.* fragrant; corolla tube glabrous, the throat fleshy, the segments eight to nine lines long, obtuse; cymes twin in the forks of the branches, spreading, recurved, much shorter than the leaves, many-flowered. June. *l.* broadly lanceolate, acute at base, obtuse and acuminate at apex, 4in. long; petioles four to six lines long. Branches terete. *h.* 6ft. Chittagong and Tenasserim, 1824. SYN. *T. gratissima* (B. R. 1084).

T. Wallichiana (Wallich's). *fl.* on pedicels twice as long as the calyx; corolla tube four to five lines long, the lobes narrow, falcate, rather obtuse; peduncles twin in the forks of the branches, spreading-recurved, dichotomous, three to five-flowered. Summer. *l.* broadly lanceolate, very shortly narrowed into the petioles, obtuse and acuminate at apex, 3in. to 4in. long; petioles very short, channelled. *h.* 2ft. to 3ft. Sumatra, 1873.

perianth brown at base, the rest green, glabrous, the segments broadly ovate; involucre of six or seven leaves; scape 5ft. to 6ft. high. May. *l.* about three, 2ft. to 3ft. in diameter, trisected; segments stalked, pinnatifid; petioles 2ft. long, stout, erect. Root tuberous. Madagascar, &c., 1872. (B. M. 6124.)

T. aspera (rough). A synonym of *T. integrifolia.*

T. cristata (crested). *fl.* dull purplish-brown, numerous, in a nodding, lateral umbel; involucre of four leaves, the lower ones smaller, sessile, the two upper large, flat, erect, purple in colour. Summer. *l.* lanceolate-oblong, with long, channelled, cylindrical petioles. *h.* 1½ft. to 2ft. Malaya, 1812. (B. M. 4589). SYN. *Ataccia cristata* (F. d. S. 860-1; F. M. 338; L. J. F. 186-7; R. H. 1866, 51).

T. integrifolia (entire-leaved).* *fl.* four to eleven, long-pedicellate, at first sub-erect, at length nodding; perianth green, variegated with purple and yellow; spathes ovate, twisted; scapes axillary, solitary. June. *l.* shining-green, recurved, oblong, acuminate, 8in. to 16in. long. Stem none or very short. Chittagong, 1810. (B. M. 1488.) SYN. *T. aspera.*

T. lævis (smooth). *fl.* six to twelve, umbellate; perianth greenish-violet, with a cup-like, sessile tube; involucre four-leaved; scapes axillary, solitary, shorter than the petioles. July. *l.* oblong, acuminate, glabrous, about 1ft. long. Stem none. Silhet, Khasya, Assam, Birma, &c., 1820.

T. pinnatifida (pinnatifid).* Otaheite Salap-plant; South Sea

Tacca—*continued.*

Arrowroot-plant. *fl.* in a dense umbel, subtended by several leafy bracts; perianth purplish, funnel-shaped, with six subequal segments. June. *fr.* somewhat pear-shaped, with prominent ribs. *l.* long-petiolate, large, three-parted, the forked divisions pinnatifid down to a narrow wing, with irregular, ovate, acute segments. Stem none. Rhizome tuberous. East Indies and Society Islands, 1793. See Fig. 1. (L. B. C. 692; R. G. 582.)

TACCACEÆ. A small natural order of perennial herbs, with tuberous or creeping rhizomes, inhabiting tropical regions and China. Flowers regular, hermaphrodite, densely umbellate at the apex of an erect, leafless scape; perianth often brown, lurid, or green above, above the ovary broadly urceolate or globose-campanulate, the tube short and broad; lobes six, biseriate, sub-equal or the inner ones broader, all connivent in a globe or the outer ones (or all) spreading; stamens six; filaments very short; anthers two-celled; ovary inferior; style short, columnar; outer bracts herbaceous or coloured; inner ones long, filiform. Fruit globose, ovoid, turbinate, or elongated, often triquetrous or six-ribbed, baccate, indehiscent or rarely at length three-valved. Leaves radical, large, petiolate, sometimes undivided and entire, occasionally variously lobed and dissected. The order consists of two genera—*Schizocapsa* and *Tacca*—and includes only about ten species.

TACCARUM (name adapted from *Tacca*, from the resemblance to that genus). SYNS. *Endera*, *Lysistigma*. ORD. *Aroideæ* (*Araceæ*). A small genus (three or four species) of tall, stove, tuberous, Brazilian herbs. Flowers monœcious; spathe erect, the tube short and convolute, the blade gaping or explanate, oblong, acute; spadix inappendiculate, shorter than the spathe, shortly stipitate, loose-flowered, the male inflorescence ovoid or elongated longer than the petioles. Leaves long-petiolate, broadly hastate-ovate, bipinnatifid; pinnæ undulated. Two of the species have been introduced. They are closely allied to **Staurostigma** (which *see* for culture).

T. peregrinum (foreign). *fl.*, spathe olive-green, ovate, acuminate, slightly exceeding the spadix; spadix sub-cylindrical, attenuated from the base to the apex, clothed throughout with flowers, the male and female inflorescences of equal length. *l.* solitary, cotemporary with the flowers, large, tripartite, pinnatifidly compound; petioles long, terete, spotted, 3ft. high. Tuber sub-hemispherical. 1873. SYNS. *Endera conophalloidea* (R. G. 732), *Lysistigma peregrinum*.

T. Warmingianum (Dr. Warming's). *fl.*, spathe light coppery-tinted brown, 1½ft. long, convolute below, open above; spadix shorter than the spathe; ovaries green, surrounded by four to six fleshy, dirty-brown staminodia; stamens of male flowers united into a thick, fleshy, round-topped, pinkish column; scape 8in. long. October to January. *l.* solitary, bright green, with a spread of 2ft. to 2½ft., having three principal bipinnatifid divisions; petiole 3ft. high, stout, light green, marked with numerous white lines. 1882. (G. C. n. s., xvi., p. 661; R. G. 1124.)

TACHIA (of Persoon). A synonym of **Tachigalia** (which *see*).

TACHIADENUS (from *Tachia*, a genus of the same order, and *aden*, a gland; the ovary is surrounded by a ring of glands, as in *Tachia*). ORD. *Gentianeæ*. A genus including five species of stove herbs or sub-shrubs, endemic in Madagascar. Flowers pink or white, sometimes violet with a white tube, large, few in a terminal cyme, or solitary; calyx tubular, multi-glandular within, five-cleft at apex, five-keeled or five-winged; corolla salver-shaped or funnel-like, with a long tube and five spreading, twisted lobes; stamens five. Leaves sessile or stalked, often three-nerved. Only one species has been introduced. It thrives in a mixture of sand, loam, and peat, and requires to be kept rather dry in winter. Propagated by cuttings, inserted in sand, under a hand glass, in heat.

T. carinatus (keeled).* *fl.*, calyx ⅜in. long, the obverse wings half-lanceolate, the lobes linear; corolla tube white, 2in. long, swollen at apex, the lobes violet, rounded, obtuse, less than 1in. long; cyme terminal, twice dichotomous. October. *l.* oval, sessile, three-nerved. Stem suffruticose, tetragonal. 1858. (B. M. 5094.)

TACHIGALIA (*Tachigali* is the native name in Guiana). SYNS. *Cubœa*, *Tachia* (of Persoon). ORD. *Leguminosæ*. A small genus (four or five species) of tropical American, unarmed, stove trees. Flowers yellow (?), very shortly pedicellate, racemose; calyx segments five, unequal; petals five, scarcely unequal; stamens ten. Leaves abruptly pinnate. *T. bijuga* and *T. paniculata* have been introduced, but are now probably lost to cultivation.

TACSONIA (from *Tacso*, the Peruvian name of one of the species). Passion Flower. Including *Poggendorffia*. ORD. *Passifloreæ*. A genus comprising about thirty species of stove or greenhouse, often pubescent, climbing shrubs, natives of tropical America, mainly differing from *Passiflora* in the usually long, cylindrical tube of the calyx, which is furnished with two crowns, one at the throat, and the other near its base. Petals five, often smaller than the calyx lobes; corona entire or filamentose; stamens five. Leaves alternate. Tendrils lateral, undivided. The species known to cultivation are here described. For culture, *see* **Passiflora.**

T. Buchanani (Buchanan's). A synonym of *Passiflora vitifolia*.

T. insignis (remarkable).* *fl.* solitary, axillary, 6in. to 8in. in diameter; tube 2in. long, with a depressed bulb at the base; sepals violet-crimson, linear-oblong, concave, with a green keel terminating below in a green spur 1in. long; petals darker crimson and shorter than the sepals, nearly flat; corona ½in. long, of one series of white threads mottled with blue; inner corona an inflexed membrane at the base of the tube above the bulb. Summer and autumn. *l.* 5in. to 7in. long, ovate or oblong, or lanceolate-ovate from a cordate base, obscurely lobed, toothed; petioles short, stout, glandular; stipules small, pinnatisect. Young parts, petioles, peduncles, and leaves beneath, clothed with pale or dark rusty-brown wool. Peru (?). Warm greenhouse. (B. H. 1874, 10; F. M. n. s. 89; G. C., 1873, 1112.) SYN. *Passiflora insignis* (B. M. 6069; F. d. S. 2083-4.)

T. manicata (collared).* *fl.* on peduncles which are longer than the petioles; tube inflated at base, ten-lobed; limb vivid scarlet, 4in. in diameter; corona double; the outer at the mouth of the tube, of many short, blue hairs; the inner at the top of the inflated base of the perianth; bracts elliptic-ovate, pubescent. July. *l.* about 4in. long, coriaceous, three-lobed to about the middle, finely serrate; lobes broadly oblong, obtuse or sub-acute, paler beneath; petioles about 1in. long, with three or four glands. Stem, leaves beneath, stipules, bracts, and perianth externally, finely pubescent. Peru, before 1850. Stove or warm greenhouse. (L. & P. F. G. i. 26.) SYN. *Passiflora manicata* (B. M. 6129).

T. mixta (mixed). *fl.* pink; tube cylindrical, 4in. to 5in. long, glabrous or pubescent; sepals and petals obtuse; bracts oblong, 1½in. to 2in. long, herbaceous or coloured, coalescing in an involucre. Late summer. *fr.* ovoid, glabrous or pubescent, edible. *l.* coriaceous, orbicular, three-lobed to the middle; lobes ovate-oblong, acute, serrated; petioles 1in. to 1½in. long, with six to eight sessile or stipitate glands. Stem angular. Andes. Plant glabrous or more or less pubescent. Greenhouse.

T. m. eriantha (woolly-flowered). *fl.* pink; bracts reticulate-nerved. Plant snowy-pubescent. (B. M. 5750, under name of *T. eriantha*.)

T. m. quitensis (Quito). *fl.*, involucre pubescent, cylindrical, equally or rarely unequally three-lobed at apex. *l.* nearly glabrous above, velvety beneath, three-lobed; lobes ovate or ovate-oblong; petiolar glands sessile. Stem velvety. (I. H. xvi. 595, under name of *T. quitensis eriantha*.)

T. m. speciosa (showy). *fl.*, involucre pubescent, unequally two or three-lobed at apex. *l.* glabrous above, pubescent beneath, three-lobed; lobes oblong-lanceolate, uncinate-serrated; petiolar glands stipitate. Stem sub-terete, glabrous.

T. mollissima (very soft).* *fl.* pink; tube cylindrical, 4in. to 5in. long, highly glabrous; bracts 1in. long, forming an urceolate involucre, irregularly cut at the top. August. *fr.* yellowish, ellipsoid, 4in. long. *l.* 4in. to 5in. long, 5in. to 6in. broad, cordate-trilobed; lobes diverging, ovate-lanceolate, serrated; petioles 1½in. long, glandular; stipules six to eight lines long, deeply serrated. Quito, 1845. Whole plant softly pubescent. Greenhouse. (B. H. vii., p. 142; B. M. 4187; B. R. xxxii. 11; F. d. S. ii. 70; P. M. B. xiii. 25.)

T. Parritæ (Parrita's). *fl.*, tube long and slender; sepals five, rosy-orange, oblong-hooded, acute-pointed; petals rich orange, oblong, flat; corona consisting of an outer row of tooth-like projections, and an inner membranous fold bent downwards; stalks cylindrical, longer than the leaves. *l.* three-lobed, glabrous above, pilose beneath; petioles channelled above; stipules entire, subulate-acuminate. Tolima, 1882. Stove or greenhouse. (G. C. n. s., xvii., p. 225.)

T. pinnatistipula (pinnate-stipuled). *fl.* pale rose-colour, 4in. to 6in. long; tube cylindrical, dilated at base; coronal filaments

Tacsonia—*continued.*

one-half shorter than the sepals and petals; bracts 1in. long, serrated; peduncles 4in. long. September. *fr.* sub-globose, tomentose, edible. *l.* coriaceous, tomentose beneath, tripartite, 3in. to 5in. long, 3½in. to 4in. broad; lobes lanceolate, serrated; petioles 1in. long; stipules 1in. long, pinnatisect. Chili and Peru, 1828. Greenhouse. (B. iv. 171; B. M. 4062; S. B. F. G. ser. ii. 156.) SYN. *Passiflora pinnatistipula* (B. R. 1536). *Poggendorffia rosea* is simply a monstrous form of this species.

T. Van-Volxemii (Van Volxem's).* *fl.* scarlet, very showy; tube cylindrical, 1½in. long, dilated at base, the limb 4in. to 5in. in diameter; sepals and petals linear-oblong; peduncles slender, twice as long as the leaves; bracts 1in. long, serrated. Late summer. *fr.* ellipsoid, edible. *l.* glabrous, 4in. to 5in. long and broad, tripartite; lobes lanceolate, narrowed at base; petioles 1½in. long, with many glands; stipules linear. New Grenada, 1866. Stove or warm greenhouse. One of the finest species. (B. M. 5571; F. M. 289; G. C. 1866, p. 171; I. H. x. 381.)

TÆNIOCARPUM. A synonym of **Pachyrhizus** (which *see*).

TÆNIOPHYLLUM (from *tainia*, a band, and *phyllon*, a leaf; in reference to the linear leaves). ORD. *Orchideæ*. A genus embracing about half-a-dozen species of stove or greenhouse, dwarf, epiphytal Orchids, almost stemless and leafless, or with a tuft of linear leaves; they are natives of the East Indies, the Malayan Archipelago, the Pacific Islands, and Australia. Flowers minute, in small racemes; sepals and petals nearly equal, erect or connivent, connate at base; lip adnate to the column at base, and produced into a short spur or pouch; pollen masses four, in two pairs. None of the species have been introduced.

TÆNIOPSIS. Included under **Vittaria** (which *see*).

TÆNITIS (from *tainia*, a fillet or ribbon; alluding to the linear pinnæ). Including *Cuspidaria*, *Neurodium*, *Paltonium*, and *Pteropsis*. ORD. *Filices*. A small genus (five species) of interesting, stove Ferns, all tropical, but not very closely allied. Sori linear, but the line sometimes interrupted, central or sub-marginal. Some of the species scarcely differ from *Tæniopsis* [included under *Vittaria*] in fruit, but in all those placed here the veins anastomose. The following species have been introduced. For culture, *see* **Ferns.**

T. angustifolia (narrow-fronded). *fronds* 1ft. to 1½ft. long, ¼in. to ½in. broad, narrowed very gradually to an acute point and below to the base or a short stem, flaccid; midrib distinct; veins immersed, forming two or three rows of vertical, hexagonal areolæ. *sori* sunk in a groove, a short distance from the edge. Cuba to North Brazil, 1816. SYN. *Pteropsis angustifolia.*

T. blechnoides (Blechnum-like). *rhiz.* creeping. *sti.* 8in. to 12in. long, firm, naked, glossy. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, simply pinnate; pinnæ of barren fronds two or three on each side, 6in. to 9in. long, 1in. to 2in. broad, oblong-lanceolate, acuminate, cuneate at base, the edge thickened and wavy, the lower ones stalked; fertile pinnæ narrower and more numerous. *sori* in a continuous line about midway between the edge and midrib. Malaccas and Philippines.

T. b. interrupta (interrupted). *fronds*, pinnæ smaller than in the type. *sori* interrupted and much nearer the edge.

T. furcata (forked). *rhiz.* somewhat creeping, densely tomentose. *fronds* 6in. to 18in. long, once or twice dichotomously forked or sub-pinnatifid; lobes linear, erecto-patent, much acuminated, entire, 4in. to 8in. long, ¼in. to ½in. broad, coriaceous, minutely scaly below. *sori* sub-marginal, continuous or interrupted. West Indies, &c., 1824. SYNS. *Cuspidaria furcata*, *Pteropsis furcata.*

T. lanceolata (lance-shaped). *rhiz.* creeping, very stout. *sti.* 1in. to 2in. long, firm, erect. *fronds* 6in. to 12in. long, 1in. to 2in. broad, gradually narrowed from the centre to both ends, the edge entire but often crisped, firm, coriaceous, with a distinct midrib; areolæ immersed. *sori* in continuous or interrupted lines near the edge of the contracted upper third or quarter of the frond. West Indies and Guatemala, 1818. SYNS. *Neurodium lanceolatum*, *Paltonium lanceolatum.*

TÆTSIA. A synonym of *Cordyline.*

TAGETES (a name of mythological derivation, from Tagus, one of the Etruscan deities). Marigold. ORD. *Compositæ*. A genus comprising about a score species of mostly hardy, erect and branched or diffuse, annual herbs, natives of the warmer parts of America. Flower-heads yellow or orange, long-pedunculate or densely corymbose; ray florets one-seriate, solitary, or rarely deficient; disk hermaphrodite; involucral bracts one-seriate; receptacle

Tagetes—*continued.*

flat, often small; achenes linear, glabrous or pilose. Leaves opposite, pinnately dissected or rarely undivided and serrulated. The best-known species are here described. For culture, and further remarks respecting *T. erecta* and *T. patula*, *see* **Marigold.**

T. corymbosa (corymbose) A synonym of *T. patula.*

FIG. 2. FLOWERING BRANCHLET OF TAGETES ERECTA.

T. erecta (erect).* African Marigold. *fl.-heads* citron-yellow, twice the size of those of the French Marigold; involucre sub-angular; peduncles one-headed, thickened at the apex. July.

FIG. 3. FLOWERING BRANCH OF TAGETES PATULA.

Tagetes—*continued.*

l. pinnatisect; segments lanceolate, serrulated; serratures, especially those of the upper leaves, aristate. Stems and branches erect. *h.* 2ft. Mexico, 1596. See Fig. 2.

T. florida (flowery). A synonym of *T. lucida.*

T. glandulifera (gland-bearing). *fl.-heads* pale yellow, fascicled-corymbose; involucre cylindrical. October. *l.* alternate, pinnatisect; segments thirteen to seventeen, linear-sub-lanceolate, acuminate at each end, 1½in. or more long. Stems and branches erect, the latter short. *h.* 4ft. South America, 1826.

T. lucida (shining). Sweet-scented Mexican Marigold. *fl.-heads* yellow; involucre cylindrical. August. *l.* lanceolate, argutely serrated, aristate-serrated at base. Stems erect, scarcely branched. *h.* 1ft. Mexico and South America, 1798. Half-hardy. (A. B. R. 359; B. M. 740.) This species varies in having the lower leaves obtuse, and the upper ones acute and narrower. SYN. *T. florida* (S. B. F. G. ser. ii. 35).

T. patula (spreading).* French Marigold. *fl.-heads* fuscous-golden or fulvous; involucre smooth; peduncles elongated, one-headed, nearly cylindrical. August. *l.* pinnatisect; segments linear-lanceolate, serrated; serratures, especially the upper ones, aristate. Stems erect; branches spreading. *h.* 1½ft. Mexico, 1573. See Fig. 3. (B. M. 150.) SYN. *T. corymbosa* (B. M. 3830; S. B. F. G. 151).

T. signata (distinct). Striped Mexican Marigold. *fl.-heads* yellow; involucre oblong-ovate, five-angled; peduncles one-headed, scarcely thickened above. Summer. *l.* pinnatisect, segments six pairs, oblong-lanceolate, incised-serrated, the lower serratures aristate. Stems erect, branched. *h.* 1½ft. Mexico.

FIG. 4. TAGETES SIGNATA PUMILA, showing Habit and detached Portion of Inflorescence.

T. s. pumila (dwarf). This is of dwarfer, more compact habit than the type. See Fig. 4. (R. H. 1863, p. 11.)

T. tenuifolia (slender-leaved).* *fl.-heads* yellow, unspotted; ray florets ample, nearly round; involucre obovate, smooth, shorter than the disk; achenes black. August. *l.* opposite or alternate, pinnatisect; segments thirteen to seventeen, linear, serrated, the serratures of the upper leaves aristate. *h.* 2ft. Mexico and Peru, 1797. Plant erect, slightly branched. (B. M. 2045; S. F. G. 141.)

TAIL-FLOWER. A common name for *Anthurium.*

TAILS. The long, feathery or hairy terminations of certain fruits.

TAINIA (from *tainia*, a band or fillet; in allusion to the shape of the lip). SYNS. *Ania, Mitopetalum.* ORD. *Orchideæ.* A small genus (six or seven species) of stove orchids, natives of the East Indies, South China, and the Malayan Archipelago. Flowers pedicellate, scattered, rather large or mediocre; sepals and petals narrow, slightly acute or long-acuminate; lip erect; column rather long; pollen masses eight; scape florid, tall, leafless, few-sheathed at base; raceme terminal, simple. Stems at length thickened into pseudo-bulbs. Only two species call for mention here. For culture, *see* **Calanthe.**

T. bicornis (two-horned). *fl.*, sepals and petals green, with a reddish tinge; lip yellow, blotched with red, the middle lobe emarginate, apiculate, not spurred, having two lamellæ at base; anthers two-horned. March. *l.* oblong-lanceolate, fleshy, shorter than the scape. Ceylon, about 1842. SYN. *Ania bicornis* (B. R. xxx. 8).

T. latifolia (broad-leaved). *fl.* green and brown; petals slightly spreading; lip unguiculate, produced with the column in a connate, trilobed sac, the lateral lobes obtuse, the middle one acute, shorter; scape 2ft. long. *l.* oblong, plicate, shorter than the scape. Sylhet, 1852. SYN. *Calanthe viridi-fusca* (B. M. 4669).

TALAUMA (the vernacular name of the South American species). ORD. *Magnoliaceæ.* A genus embracing about fifteen species of mostly stove, evergreen trees; three or four are natives of tropical America, and the rest inhabit tropical Asia and Japan. Flowers and leaves as in *Magnolia*; but the fruit differs in the fusion of its constituent carpels, and in the irregularly circular mode of splitting. The under-mentioned species are well worth cultivating on account of their beautiful and fragrant flowers. A compost of loam, peat, and sand is most suitable. Propagation may be effected by layers, or by inarching on some of the stronger-growing Magnolias. Ripened cuttings, with the leaves intact, will sometimes root if inserted in a pot of sand, under a glass, in heat.

T. Candollii (De Candolle's). *fl.* cream-coloured, large; petals nine to twelve, the outer one short; peduncles one-flowered, rather drooping, and, as well as the petioles of the younger leaves, clothed with rufous hairs. June and July. *l.* oblong, acuminate at both ends. *h.* 6ft. Java, 1828. (B. M. 4251; B. R. 1709.)

T. C. Galeottiana (Galeotti's). *fl.* dull yellow, 3in. in diameter; sepals and petals narrower than in the type. *l.* 4in. to 7in. long, narrowly elliptic-lanceolate. (B. M. 6614.)

T. Hodgsoni (Hodgson's). *fl.* creamy-white, large, terminal, solitary; sepals reddish-tinted outside, thick; petals six, the inner ones smaller. Winter and spring. *fr.* large; carpels sub-tetragonal, argutely beaked. *l.* ample, obovate-oblong, coriaceous, glabrous, the margins slightly sinuated. Himalayas. A medium-sized tree. (I. H. 1857, 141.)

T. Plumieri (Plumier's). *fl.* white, large, terminal, solitary; petals ten to twelve. All the year. *l.* oval-oblong, glabrous, 6in. long, varying in breadth from 3in. to 5in., coriaceous. *h.* 12ft. West Indies, 1829.

T. pumila (dwarf).* *fl.* cream-coloured, drooping, very fragrant at night; petals six to nine. All the year. *l.* elliptic, acuminate at both ends, smooth, reticulate-veined. *h.* 2ft. to 4ft. Amboyna and Java, 1786. The correct name of this plant is *Magnolia pumila* (A. B. R. 226; B. M. 977; L. B. C. 1555).

TALBOTIA ELEGANS. A synonym of **Vellozia elegans.**

TALEA. A cutting or small branch used for propagation.

TALEWORT. An old name for *Borago officinalis.*

TALIERA. A synonym of **Corypha** (which *see*).

TALIGALEA (said to be the native name in Guiana). *Amasonia* is now the correct name of this genus. ORD. *Verbenaceæ.* A genus comprising six species (which may be reduced to four) of stove sub-shrubs, natives of tropical America. Flowers yellow or sulphur-coloured, racemose or panicled; calyx coloured, loosely campanulate, membranous, five-cleft; corolla tube elongated, straight or incurved at base, the limb five-cleft, sub-bilabiate, with short, spreading or reflexed lobes. Leaves alternate, toothed or rarely entire; upper ones few, small. For culture of the only species introduced, *see* **Clerodendron.**

T. punicea (reddish-brown). *fl.* pale sulphur-yellow, with large, bright red bracts; racemes nodding, clothed with red-purple hairs. May and June. *l.* slender, 6in. to 12in. long, oblong- or elliptic-lanceolate, shortly acuminate, unequally toothed. Stem erect, simple or slightly branched. *h.* 2ft. to 3ft. Brazil, 1884. The correct name of this plant is *Amasonia calycina.* (B. M. 6915.) SYN. *Amasonia punicea* (Gn. xxvii. 130; R. G. 1886, 337).

TALINUM (said to be the name given to the plant by the negroes of Senegal, who eat it as a salad; but it may have been invented by Adanson). ORD. *Portulaceæ.* A genus comprising about eleven species of stove, greenhouse, or hardy, fleshy, highly glabrous, sometimes suffrutescent herbs, inhabiting tropical and warm regions: two are African and Asiatic, and the rest American. Flowers disposed in terminal panicles, cymes, or racemes, rarely solitary, axillary or lateral;

Talinum—*continued.*

sepals two, deciduous or rarely sub-persistent; petals five, hypogynous, ephemeral; stamens five or numerous. Leaves alternate or nearly opposite, flat; stipules wanting. The best-known species are here described. They are pretty succulents, and will thrive in any light soil, but they prefer sandy peat. Cuttings are a ready means of increase for the shrubby species. *T. reflexum* may be multiplied by seeds.

FIG. 5. UPPER PORTION OF PLANT, AND PORTION OF DETACHED INFLORESCENCE, OF TALINUM TERETIFOLIUM.

T. Arnotii (Arnot's).* *fl.* pale golden-yellow, 1in. in diameter; petals obovate, acute; peduncles axillary, one-flowered, longer than the leaves, spreading, with a small bract above the middle. Summer. *l.* attenuated, almost sessile, 1½in. long and nearly as broad, orbicular-oblong, rounded at both ends, apiculate at the tip, fleshy, the margins quite entire. Branches 1ft. long, succulent. Trunk or rootstalk cylindric, woody, 5in. to 8in. long. South Africa, 1867. Greenhouse sub-shrub. (B. M. 6220.)

Talinum—*continued.*

T. cuneifolium (wedge-shape-leaved). *fl.* of a reddish-violet colour, disposed in a terminal panicle; lower peduncles three-flowered. July and August. *l.* flat, wedge-shaped, obtuse, mucronate. Stem erect, 1½ft. high. India, Arabia, and Africa, 1820. Greenhouse sub-shrub.

T. patens (spreading). Puchero. *fl.* carmine; petals obovate, ¾in. long; stamens fifteen to twenty; panicle terminal, elongated, leafless, bearing dichotomous cymes. August to October. *l.* mostly opposite, oval, abruptly tapering towards the petioliform base. Stem erect, almost simple, 1ft. to 2ft. high. West Indies, 1776. Stove sub-shrub. (A. B. R. 253.)

T. reflexum (reflexed). *fl.* yellow, in a terminal panicle; peduncles usually opposite, dichotomous, bractless. August to October. *l.* flat, lanceolate or oval, obtuse, usually opposite. Stem erect, 1ft. high. South America, 1800. Stove biennial. (B. M. 1543.)

T. teretifolium (terete-leaved). Fame Flower. *fl.* pink, ¾in. broad; stamens fifteen to twenty; peduncle 3in. to 6in. long, naked, bearing an open cyme. June to August. *l.* linear, cylindrical. Leafy stems low, tuberous at the base. North America, 1823. Greenhouse perennial. See Fig. 5. (B. R. xxix. 1; L. B. C. 819.)

T. triangulare (triangular). *fl.* red or white, arranged in terminal, corymbiferous cymes; petals rounded, ¼in. long; stamens about thirty. August and September. *l.* alternate, obovate-lanceolate, tapering towards the sub-sessile base. Stem simple, about 2ft. high. West Indies, 1739. Stove sub-shrub.

T. t. crassifolium (thick-leaved). *l.* usually broader, often emarginate and mucronate. Stem higher and branched.

TALIPOT PALM. A common name for **Corypha umbraculifera** (which *see*).

TALISIA (said to be the native name of some members of the genus in Guiana). SYN. *Comatoglossum.* ORD. *Sapindaceæ.* A genus including about eighteen species of stove, evergreen trees, inhabiting Brazil, New Grenada, and Guiana. Flowers mediocre or small, in branched panicles; sepals erect, biseriate; petals five, rarely more, unguiculate, the margins villous; stamens eight, rarely five or seven. Leaves alternate, exstipulate, abruptly pinnate; leaflets alternate and opposite, coriaceous, oblong, acuminate, entire. *T. guianensis*, the only species introduced, thrives in a compost of turfy loam and peat. Large cuttings, with the leaves intact, will root in sand, under a glass, in moist heat.

T. guianensis (Guiana). *fl.* rose-coloured, disposed in decompound racemes; calyx shorter than the petals. June. *l.*, leaflets many pairs, ovate-lanceolate, acuminate, coriaceous, quite smooth on both surfaces. *h.* 4ft. Guiana and Cayenne, 1824. (A. G. 136.)

TALLIES. Another name for labels made of wood, cast iron, porcelain, and other substances, for permanently attaching to plants or trees. *See* **Labels.**

TALLOW SHRUB. A common name for **Myrica cerifera** (which *see*).

TALLOW-TREE, CHINESE. A common name for *Stillingia sebifera.*

TALLOW-TREE, SIERRA LEONE. A common name for **Pentadesma butyracea** (which *see*).

TALPA EUROPÆA. *See* **Mole.**

TAMARIND-TREE. *See* **Tamarindus indica.**

TAMARINDUS (from the Arabic, *tamr*, a ripe date, and *Hind*, India; literally, Indian Date). ORD. *Leguminosæ*. A monotypic genus. The species is a large, stove, unarmed tree. Its medicinal virtues, as far as the fruits are concerned, are well known. The bark, wood, leaves, and flowers are all economically valuable. A compost of fibrous loam and sand is most suited to the requirements of *T. indica*. Seeds, which are annually imported from the East and West Indies, should be sown on a hotbed, and the young plants, when about 3in. high, inserted singly in pots. Cuttings also root readily in sand, under a glass, in heat.

T. indica (Indian). Tamarind-tree. *fl.* few together in copious, lax racemes at the ends of the branchlets; petals yellow, striped with red, less than ½in. long, only the three upper ones developed; pedicels articulated at the base of the calyx. June and July. *fr.*, pods 3in. to 6in. by 1in. or more, three to ten-seeded, ligulate. *l.* abruptly pinnate, with twenty to forty close, opposite, oblong, obtuse, glabrescent leaflets. *h.* 40ft. to 60ft. Tropics (probably indigenous in Africa), 1633. (B. F. S. 184; B. M. Pl. 92). SYNS. *T. occidentalis*, *T. officinalis* (B. M. 4563). The West Indian pods are generally shorter than those grown in the East Indies.

T. occidentalis (Western). A synonym of *T. indica*.

T. officinalis (officinal). A synonym of *T. indica*.

TAMARISCINEÆ. A natural order of shrubs, sub-shrubs, and rarely trees or durable herbs, found mostly in the temperate and warmer regions of the Northern hemisphere, and also in South Africa. Flowers often white or pink, regular, often hermaphrodite, fleshy, small or showy, variously disposed; sepals three, rarely four, free or connate at base, closely imbricated; petals five, rarely four, inserted under the disk, imbricated, free, or the base cohering in a tube; disk hypogynous or loosely perigynous, ten-glandular, crenate or angular, rarely obsolete; stamens five or numerous, inserted on the disk, free or variously connate at base; anthers two-celled; ovary free. Capsule dehiscent, coriaceous. Leaves alternate, small, sometimes scale-like, entire and often fleshy or impressed-dotted; stipules none. *Tamariscineæ* contain tannin, resin, and a volatile oil, which render them bitter and astringent. The order embraces five genera—*Fouquiera*, *Hololachne*, *Myricaria*, *Reaumuria*, and *Tamarix*—and scarcely forty species.

TAMARISK. *See* **Tamarix.**

TAMARIX (the old Latin name used by Pliny). Tamarisk. ORD. *Tamariscineæ*. A genus comprising about twenty species of very elegant, greenhouse or hardy bushes or small trees, distributed where the order extends. Flowers white or pink; sepals four or five, rarely six, free; petals inserted under the disk, free or lightly connate at base; stamens four, five, eight, or ten; anthers apiculate; disk more or less lobed; inflorescence of lateral or terminal spikes or dense racemes. Leaves minute, scale-like, amplexicaul or sheathing. The manna of Mount Sinai, which consists wholly of mucilaginous sugar, is produced by a variety of *T. gallica*. Sandy loam is most suitable to the culture of the greenhouse sorts. *T. gallica* will thrive under almost any conditions, and is admirably suited for ornamenting shrubberies; it is also invaluable as a seaside plant, and is very extensively employed along the South Coast. Propagation may be readily effected by cuttings, inserted in sand, under a bell glass, the greenhouse kinds in heat.

T. africana (African). A synonom of *T. parviflora*.

T. articulata (jointed). *fl.* pink, ¼in. in diameter, sub-sessile; spikes slender, more or less interrupted, usually sessile. July. *l.* reduced to a very short sheath, with a minute tooth. Branches fastigiate, elongated, slender, cylindric, jointed. *h.* 10ft. to 25ft. India. A greenhouse bush or coniferous-looking tree. SYN. *T. orientalis*.

T. dioica (dicœious). *fl.* pink, ¼in. in diameter, dicœious; spikes dense, panicled, 1in. to 2in. long, about equalling their peduncles. June. *l.* sheathing, glabrous, green, obliquely truncate and acuminate. Branches with drooping extremities; ultimate branchlets elongated, spreading-fastigiate. *h.* 6ft. India, 1823. A small, greenhouse tree.

Tamarix—*continued.*

T. gallica (French).* Common Tamarisk. *fl.* white or pink, in catkin-like, obtuse spikes 1in. long; disk acutely five-angled. July to September. *l.* on the branchlets extremely minute, closely imbricated, triangular, auricled, keeled; those on the older wood ⅛in. long, subulate. Branchlets excessively slender and feathery. *h.* 5ft. to 10ft. India to Europe. Hardy shrub or small tree.

FIG. 6. FLOWERING BRANCH OF TAMARIX GALLICA INDICA.

T. g. indica (Indian). *fl.*, lobes of the disk entire or nearly so. *l.* semi-amplexicaul. Branchlets divaricate. Greenhouse. See Fig. 6.

T. g. Pallasii (Pallas'). *fl.* rosy-pink; lobes of disk deeply emarginate. *l.* shortly decurrent. Branchlets erect. Thibet, &c.

T. orientalis (Eastern). A synonym of *T. articulata*.

T. parviflora (small-flowered).* *fl.* pink, small; spikes or racemes lateral, crowded, nine to ten lines long. Summer. *l.* small, lanceolate, subulate, a little keeled, acute. South-eastern Europe, Levant. Hardy shrub. (F. d. S. 838.) SYNS. *T. africana*, *T. tetrandra*, of gardens (R. H. 1855, 401).

T. tetrandra (four-anthered). *fl.* white; racemes lateral, nearly 1½in. long. July. *l.* lanceolate, amplexicaul; adult ones diaphanous at apex. *h.* 6ft. to 8ft. Caucasus, 1821. Hardy shrub.

T. tetrandra (four-anthered), of gardens. A synonym of *T. parviflora*.

TAMNUS. A synonym of **Tamus** (which *see*).

TAMONEA (from *Tamone*, the name of the genus in Guiana). SYNS. *Ghinia*, *Ischnia*, *Kæmpfera*, *Leptocarpus*. ORD. *Verbenaceæ*. A small genus (four species) of erect, stove herbs or sub-shrubs, natives of tropical America. Flowers small, few in a spike; corolla limb spreading, five-cleft. Leaves opposite, small, sub-sessile. *T. spicata* and *T. verbenacea* have been introduced, but are now probably lost to cultivation.

TAMONEA (of Aublet). Included under **Miconia** (which *see*).

TAMUS (the old Latin name used by Pliny). SYN. *Tamnus.* ORD. *Dioscoreaceæ.* A small genus (two species) of greenhouse or hardy, tuberous-rooted twiners; one is a native of the Canary Islands, and the other is broadly dispersed over Europe, North Africa, and temperate Asia. Flowers dicœcious; racemes axillary; males often elongated, loose, the flowers disposed in small, few-flowered racemes, or solitary and pedicellate at the sides of the rachis; females very short, few-flowered, sometimes reduced to a sessile fascicle. Berry sub-globose, succulent, indehiscent. Leaves alternate, cordate, entire or three-lobed. *T. communis* is the only species calling for description here. It thrives in any ordinary soil, and may be increased by divisions of the root; or by seeds, raised in a cold frame.

T. communis (common). Black Bryony; Lady's Seal; Murrain Berries, &c. *fl.* ¼in. in diameter; female racemes 1in. shorter than the males, recurved, few-flowered. May and June. *fr.* red, oblong, ½in. long. *l.* ovate-cordate, acuminate, 2in. to 3in. long, on long petioles, obscurely laterally lobed, five to seven-nerved, the tips bristly; stipules reflexed. Stem many feet long, angular, branched. Rootstock ovoid, black, fleshy. Europe (Britain), &c. (Sy. En. B. 1508.)

TAN, or TANNERS' WASTE. This consists of the bark of various trees, chiefly the Oak, Larch, and Willow. The tannin is extracted for the purpose of tanning leather, and a large quantity of refuse remains to be disposed of. This refuse is frequently employed for making hotbeds, as it gives a steady heat for a considerable time, the heat being more easily regulated, and retained longer, than that obtained from pure stable-yard manure. In general, however, a mixture of manure and dead leaves is preferred to Tan, as, when it has lost its heat, and has to be replaced in the hotbed, this mixture forms a valuable manure for the soil; while Tanners' Waste decays slowly, and is of little value as manure. Analysis shows that the nitrogenous matters of the fresh bark are almost entirely removed from it in the processes of extracting the tannin; while some of the tannin remains, and hinders decay of the refuse. Nearly half the weight of the Tan is water; and the ash, or mineral compounds in the Tan, consists very largely of Carbonate of Lime, and of Silica; the valuable Phosphates and Potash salts being present in it only in very small quantity. If employed as manure, Tan should be made up into a compost with earth, lime, and farmyard manure, and the whole should be saturated occasionally with liquid manure, and allowed to ferment for a considerable time before it is used.

TANACETUM (said to be an altered form of Athanasia, from *athanatos*, immortal; in allusion to the persistent flowers). Tansy. ORD. *Compositæ.* A genus embracing about thirty species of mostly hardy, erect, often odorous, annual or perennial herbs, often suffrutescent at base, natives of Europe, North Africa, Central and Northern Asia, and North America. Flower-heads yellow, small or mediocre, corymbose, or rarely solitary and long-pedunculate, disk-formed; involucre hemispherical or campanulate, rarely ovoid, the bracts many-seriate; receptacle flat or slightly convex, naked; achenes and florets often glandular. Leaves alternate, variously dissected, or rarely entire and toothed. The species are not possessed of much beauty. Those here described are perennials, thriving in ordinary soil. Propagated by divisions.

T. Balsamita (Balsamita). Costmary. *fl.-heads* yellow, in branched corymbs; ray very small or absent. Autumn. *l.* elliptic, obtuse, minutely and regularly crenate-dentate, the radical ones stalked, often sub-cordate. *h.* 2ft. to 3ft. Orient (naturalised in several European countries). SYN. *Balsamita vulgaris.*

T. elegans (elegant). A synonym of *T. huronense.*

T. huronense (Lake Huron). *fl.-heads* golden-yellow, twin or sub-corymbose; involucre campanulate; florets thickened at base and apex. Summer. *l.* bipinnate; lobes short, rounded, entire or three-lobuled, the margins revolute. Stem erect, branched, and (as well as the young leaves) silvery-velvety. *h.* 1½ft. North America. SYN. *T. elegans* (F. d. S. 1191).

T. leucophyllum (white-leaved).* *fl.-heads* golden-yellow, corymbose; involucre hemispherical, with imbricated bracts; florets slightly exceeding the involucre; peduncles solitary in the axils of the upper leaves. Summer. *l.* sessile or shortly petiolate, roundish-ovate; lower ones bipinnatisect; upper ones pinnatisect. Stems ascending. *h.* 9in. Turkestan. Plant silvery-silky. (R. G. 1064.)

T. vulgare (common). Buttons; Common Tansy. *fl.-heads* many, ⅓in. in diameter, corymbose; peduncle stout. August and September. *l.* 2in. to 5in. long, once or twice pinnatifid, oblong, glandular-dotted; upper ones half-amplexicaul; lower ones petiolate. Stem 2ft. to 3ft. high, grooved and angled, leafy. Europe (Britain), &c. (F. D. v. 871; Sy. En. B. 716.) A variety with curled leaves is cultivated as an ornamental plant for garnishing dishes.

TANGHIN. *See* **Tanghinia.**

TANGHINIA (*Tanghin* is the native name of the plant in Madagascar). ORD. *Apocynaceæ.* A monotypic genus. The species is a small, glabrous, stove, evergreen tree, included, by Bentham and Hooker, under *Cerbera.* Its fruit is known as the Ordeal Nut of Madagascar. For culture, *see* **Cerbera.**

T. venenifera (poison-bearing). Ordeal-tree. *fl.* in large, terminal cymes, each supported by a couple of bracts; corolla salver-shaped, with rose-coloured lobes and a green, funnel-shaped tube, which is hairy within. May. *fr.* purplish, tinged with green, ellipsoid, 2in. to 3in. long, containing a hard stone. *l.* smooth, alternate, lanceolate, rather thick, about 6in. long, clustered towards the points of the branches and directed upwards. *h.* 20ft. Madagascar, 1826. (B. M. 2698, under name of *Cerbera Tanghin.*) The seeds of this plant furnish a powerful poison, and were formerly largely used as an ordeal by the kings of Madagascar. For a full and very interesting historical account, see Mr. Telfair's letter published in the "Botanical Magazine" at the figure quoted.

TANK. A cistern or reservoir, which, on a large or small scale, is invaluable in every garden for collecting and preserving water until required for use. Every horticultural structure should be provided with a Water-tank in some convenient position into which the rain-water that falls on the roof should be conducted, and an additional means of supply provided, if possible, to use when this fails. Tanks may be built, in any size desired, with bricks and cement, or purchased, ready for fixing, made of galvanised iron or slate.

TANKERVILLIA. A synonym of **Phaius** (which *see*).

TANNER'S-TREE. An old name for **Coriaria myrtifolia** and other species.

TANSY. *See* **Tanacetum vulgare.**

TAONABO. A synonym of **Ternstrœmia** (which *see*).

TAPE GRASS. *See* **Vallisneria spiralis.**

TAPEIONITES. Included under **Sinningia** (which *see*).

TAPER. The opposite of angular. *See* **Terete.**

TAPIOCA-PLANT. A common name for **Manihot utilissima** (which *see*).

TAPOGOMEA. A synonym of **Cephaelis** (which *see*).

TAP-ROOTED. Having a large, simple, conical root, forming a centre round which the divisions are arranged.

TAR. Of late years, Tar has come to be regarded as a most valuable remedy against the ravages of many insects in gardens; and it is also used for the protection of farm crops. References have been made to it in treating of the remedies for insect attacks under the names of various plants; but it may be of use to give here a summary of the best methods of employing it.

As a preventive of attack, Tar is employed against such larvæ as conceal themselves underground during the day, and crawl up tree-trunks at night, It is also used to prevent the ascent of the females of the Winter Moths (*see* **Hybernia** and **Winter Moth**), and other

Tar—*continued.*

female insects that cannot fly. These insects are thus prevented from reaching the leaf and flower-buds for egg-laying, and the trees are saved from destruction by the larvæ. The Tar may be applied directly on the bark, in a broad ring, mixed with an equal bulk of cart-grease, or with one-third part of fish-oil; the latter being added to prevent the Tar from losing its stickiness in frosty weather. On warm days, this mixture becomes fluid, and sinks into the bark; and trees with thin bark are liable to be injured by it. This difficulty may be overcome by placing a belt of straw-rope, or cloth, or strong paper, round the trunks that might be injured, and putting the Tar on the belt.

Tar-water and Spirits of Tar are also used as preventives; sand, well saturated with them, being laid round the base of each stem, to prevent the passage of insects to the plant. Tar-water is sometimes syringed over plants, as, in weak solutions, it is a good insecticide, and, by its smell, also deters insects from laying eggs on plants so treated.

Tar has been employed with great success for the capture of such insects as the beetles that devour Raspberries (*see* remarks on INSECTS under **Raspberry**), Turnips, and other plants, and also against such insects as Frog-hoppers. In America, it has proved itself the most effectual means of capturing the notorious Rocky Mountain Locusts. A light framework of wood is covered with thin wooden boards, cloth, or strong paper, so as to form a shallow tray, and the inside is smeared with Tar. The mode of using the trap varies with the insects to be caught. For catching Raspberry Beetles, and other insects on trees and bushes, the branches are beaten over the tray, and the insects fall into it, and are stuck in the Tar. Against the Turnip Flea, Grasshoppers, &c., the same method may be employed as against the Rocky Mountain Locusts, viz., dragging the tray along the ground, with something about 12in. or 18in. in front to disturb the insects, and to cause them to leap, when many of them fall into the Tar, and are held fast in it.

TARAXACUM (from *tarasso*, to disturb, to alter; from its supposed effects upon the blood). Dandelion. SYN. *Leontodon* (of Adanson). Including *Lasiopus*. ORD. *Compositæ*. A genus comprising, according to Bentham and Hooker, not more than half-a-dozen species of mostly hardy, nearly stemless herbs, broadly distributed. Flower-heads yellow, homogamous; ray florets ligulate, truncate at apex, five-toothed; involucre campanulate or oblong, the inner bracts one-seriate, the outer ones shorter and many-seriate; receptacle flat; achenes glabrous; scapes leafless, one-headed, or rarely branched at apex and two or three-headed. Leaves radical, entire, toothed, sinuate, or runcinate-pinnatifid. Only two species call for mention here. They thrive in ordinary soil, and may be increased by divisions. *T. officinale* is cultivated as a salad plant. For this purpose, seeds should be sown, in March or April, in drills 1ft. apart, or in a seed-bed, with a view to transplanting afterwards. All the after-attention necessary is that of an occasional hoeing between the plants. In the following spring, a quantity of new leaves will appear, and, in order to blanch them as they grow, the plants may be buried with sand, or covered with large, inverted flower-pots. The sand should be from 4in. to 6in. deep, and when the leaves show through it, they should be cut off at the crown, and the sand placed over others. The plants should, of course, never be allowed to flower and ripen seeds in a garden.

T. montanum (mountain). *fl.-heads* one or two on a hairy scape; involucral bracts recurved and acute at apex. August. *l.* spreading, oblong, sub-runcinate, spiny-toothed, glabrous. Armenia, 1834. SYN. *Lasiopus sonchoides* (S. B. F. G. ser. ii. 346).

T. officinale (officinal). Common Dandelion. *fl.-heads* ½in. to 2in. broad, the outer ray florets often brown on the back; involucre

Taraxacum—*continued.*

FIG. 7. TARAXACUM OFFICINALE.

campanulate, the outer bracts recurved, the inner erect. March to October. *l.* oblong-obovate or spathulate, toothed, sinuate, or runcinate-pinnatifid. Root long, stout, black. Europe (Britain), &c. A well-known medicine. See Fig. 7. (Sy. En. B. 802.)

TARCHONANTHUS (from *Tarchon*, the Arabic name for *Artemisia Dracunculus*, and *anthos*, a flower; in reference to the resemblance of the flower-heads to those of *Artemisia Dracunculus*). African Fleabane. ORD. *Compositæ*. A small genus (three species) of small, greenhouse, tomentose, South African trees. Flower-heads small, sessile or shortly pedunculate, in axillary or terminal panicles; involucre of the male flowers of five scales, connate to their middle; those of the female of many separate scales, in a double row; receptacle hairy. Leaves alternate, petiolate, entire or lobed at apex, rather thick. The introduced species thrives in sandy, fibry loam, with the addition of a little leaf mould. Propagated by cuttings, inserted in sand, under a bell glass, in the beginning of summer.

T. camphoratus (camphor-scented). *fl.-heads* purple; females composed of three to five florets; panicle terminal, many-headed. June to October. *l.* lanceolate-oblong or obovate, acute at base, sub-acute or obtuse at apex, 3in. to 5in. long, entire or denticulate; young ones densely velvety above; old ones glabrous and reticulated above, tomentose below. *h.* 6ft. 1690. (L. B. C. 382.)

TARENNA. A synonym of **Webera** (which *see*).

TARO. A native name for **Colocasia antiquorum.**

TARRAGON (*Artemisia Dracunculus*). A perennial, native of Southern Europe, cultivated for the use of its aromatic leaves in seasoning, salads, &c., and in the preparation of Tarragon vinegar. The plant succeeds best in warm, rather dry situations, and a little protection should also be afforded the roots through the winter, as during severe frost they are liable to be injured. If green leaves are required during winter, a few roots should be lifted in autumn, and placed in heat; it will need but a small quantity to maintain a succession. The foliage may also be cut and dried in autumn for use in a dry state afterwards. Tarragon may readily be propagated by division in March and April, or by cuttings struck in a little warmth when growth is commencing in spring, or later in the summer, under a hand glass placed outside. A few young plants should be raised annually to keep up a supply.

TARTAREOUS. Having a rough, crumbling surface.

TASMANNIA. Included under *Drimys*.

TASTELESS MOUNTAIN CURRANT. *See* **Ribes alpinum.**

TAUSCHERIA (named in honour of Ignatius Frederick Tauscher, Professor of Botany at Prague, who died in 1848). ORD. *Cruciferæ*. A monotypic genus. The

Tauscheria—*continued.*

species is a small, erect, branched, hardy annual, inhabiting Central Asia and North India, and having small yellow flowers and entire leaves. It has no horticultural value.

TAVERNIERA (named in honour of J. B. Tavernier, 1605-89, a celebrated traveller in the Levant). ORD. *Leguminosæ*. A small genus (seven species have been described as such, but the number may be reduced to three or four) of greenhouse, canescent or glabrous undershrubs, natives of the East Indies and the Orient. Flowers pink or white, few in axillary, pedunculate racemes; calyx teeth sub-equal, or the two upper ones more remote; standard broadly orbicular, narrowed at base, scarcely clawed; bracts minute or caducous. Pods flattened, indehiscent. Leaves few, one-foliolate or pinnately trifoliolate; leaflets often obovate or orbicular; stipules scarious. Two species have been introduced. For culture, *see* **Desmodium.**

T. lappacea (Burdock-podded). *fl.* yellow, one or two together, axillary, on short pedicels. July and August. *fr.*, pods beset with stiff bristles, which are hooked at the apex. *l.* trifoliolate; leaflets fleshy, obcordate, villous. Stems procumbent, branched, divaricate, terete. Arabia Felix, 1820.

T. nummularia (Moneywort). East Indian Moneywort. *fl.* red, glabrous, ⅜in. to ½in. long; racemes few or many-flowered, usually exceeding the leaves. June and July. *l.* shortly petiolate, usually trifoliolate; leaflets ½in. to 1in. long, obovate-oblong or nearly round, thick, thinly canescent beneath; stipules free. Branches copious. *h.* 1ft. to 2ft. India, Afghanistan, Orient, 1826.

TAWNY. *See* **Fulvous.**

TAXANTHEMA. A synonym of **Statice** (which *see*).

TAXEÆ. A tribe of *Coniferæ*.

TAXODIUM (from *Taxus*, the Yew, and *eidos*, resemblance; referring to the similarity in the leaves). Deciduous Cypress. SYNS. *Cuprespinnata, Glyptostrobus, Schubertia* (of Mirbel). ORD. *Coniferæ*. A small genus (three species) of ornamental, loosely-branched, hardy or half-hardy trees, natives of North America, Mexico, and China. Flowers monœcious; the males in compound, pyramidal spikes; the females two or three together near the spike of male flowers. Leaves deciduous or partly persistent, alternate, sub-spirally affixed, sometimes linear, distichous, and spreading, rarely small, appressed, scale-like. Cones hard, globose or ovoid; scales contracted and stipitate at base, woody at apex. Branchlets spreading or pendulous. The Deciduous Cypress is universally employed, throughout the United States, for making the best kind of shingles; and in Louisiana it is used for almost every other purpose to which timber can be applied. "The roots of large trees, particularly in situations subject to inundations, become covered with conical protuberances, commonly from 1½ft. to 2ft. high, and sometimes from 4ft. to 5ft. in thickness; they are always hollow. . . . They are made use of by the natives of the Southern States for beehives" (Loudon). In England, however, these protuberances, or "knees," are rarely produced. Perhaps the specimen showing them most perfectly is in the Syon House gardens. Being semi-aquatic, positions on the banks of rivers, and amidst marshes and swamps, are highly suitable to *T. distichum*. All the species thrive in a moist soil. Propagation may be effected by cuttings, with the leaves intact, inserted in a vessel of water, where they will root in a few weeks; by layers; or by seeds.

T. distichum (two-ranked).* Bald, Black, Deciduous, or White Cypress. *fl.*, males in flexible, pendulous catkins; females in very small bunches. May. *l.* in two rows, flat, rather distant, pectinate, horizontally spreading, twisting at base, linear, tapering to a sharp point, ½in. long, one line broad, bright green, changing in autumn to dull red. *cones* rounded or roundish-ovate, about the size of a pigeon's egg; scales thick, dull brown. Branches stout, stiff, horizontal or ascending at the ends, the lateral ones rather pendulous; branchlets very slender, elegantly

Taxodium—*continued.*

pinnate. *h.* 120ft. United States, 1640. The following are varieties:

T. d. denudatum (denuded). Branches slender, long, horizontal or drooping towards the ends, irregularly and little divided; branchlets fringed with scattered, variable, unequally-distant leaves.

T. d. fastigiatum (pyramidal). *l.* two-rowed, resembling those of the species. Branches short, erect, slightly spreading at the top. A very distinct-looking, conical-pyramidal, small tree.

T. d. microphyllum (small-leaved).* *l.* shorter than in the type, distichous, somewhat imbricated, ovate-lanceolate. Branchlets erect, pendulous, or ascending. SYN. *Glyptostrobus pendulus* (B. M. 5603).

T. d. nanum (dwarf). Branches numerous, almost horizontal, short. This variety resembles the type, but is readily distinguishable by its very small dimensions, forming a very compact bush, 10ft. to 12ft. high.

T. heterophyllum (variable-leaved). Embossed Cypress. *l.* variable, alternate, some scale-formed, small, ovate, acute or obtuse, sometimes much longer, closely pressed and decurrent along the shoots, sometimes two-rowed, regularly tortuous, and almost awl-shaped, three to eight lines long. *cones* terminal, egg-shaped or oblong-cylindrical. Branches rising upwards and spreading at the summits; branchlets alternate. *h.* 8ft. to 10ft. China.

T. mexicanum (Mexican). A synonym of *T. mucronatum*.

T. mucronatum (mucronate-scaled). Montezuma Cypress. *l.* linear, pointed, nearly evergreen, two-rowed, straight, flat, tapering to a point, slenderer than in *T. distichum*. *cones* rather large, with the scales strongly mucronate. Branches spreading, slender. *h.* 120ft. Mexico. This species is too tender for the English climate; it may be readily distinguished from *T. distichum* by its sub-persistent leaves. SYN. *T. mexicanum*.

TAXUS (the old Latin name for the Yew, used by Virgil and Pliny, akin to Greek *Taxos* of Dioscorides). Yew. SYN. *Verataxus*. ORD. *Coniferæ*. A genus comprising six or eight species (probably varieties of one) of hardy, evergreen trees, rarely shrubs, broadly dispersed over North temperate regions. Flowers dicœcious; males

FIG. 8. MONŒCIOUS BRANCHLET OF TAXUS BACCATA, showing—*m*, Clusters of Male Flowers; *f*, Fruits almost fully grown, with the arillus almost concealing the seed; *f'*, a Young Fruit, in which the arillus only half conceals the seed; *g*, Gall of Yew Gall-midge (*Cecidomyia Taxi*), consisting of the swollen terminal bud, resembling a cone of green leaves, among which the larvæ live.

solitary in the axils, sub-sessile; female catkins axillary, sessile, one (or very rarely two?) flowered. Fruit solitary, one-seeded. Leaves sub-spirally affixed, usually distichous-spreading, very shortly petiolate, linear, flat, often falcate. "The Yew is of geological antiquity; it formed part of the forests of Britain at a period long

Taxus—*continued.*

anterior to historic times. It is found among the buried trees on the Norfolk coast, near Cromer. It also "crops up in another forest, now beneath the Bristol

FIG. 9. BRANCHLET, WITH FRUIT, OF TAXUS BACCATA ADPRESSA.

Channel, in which, if there be any truth in bones, the elephant, rhinoceros, and beaver roamed" (G. C. n. s., vi., p. 99). The wood, which is hard and compact, but

Taxus—*continued.*

quently tipped with galls of a Gall-midge (*Cecidomyia Taxi*). One of these is shown in Fig. 8. The female midge lays her eggs in the terminal bud of a twig; the larvæ hatch, and the result of their operations is the formation of a gall, which bears a strong resemblance to a cone in its form, and in the overlapping of the leaves of which it is composed. Among the leaves the small larvæ of the midge may be found. These galls are usually solitary; though two, or even three, may be found side by side at the tips of the twigs, the growth of which they check. They do not, however, inflict much injury on the trees. Should it be desired to get rid of the galls, they are so conspicuous that they can be readily detected and cut off. This should be done as soon as possible after their formation, while they still inclose the larvæ. Yews thrive in almost any soil. They are readily propagated from seeds, which should be sown in spring; the ripe fruits, after being gathered, should be mixed with sand and treated similarly to those of the Hawthorn until sowing time. Cuttings also afford a ready means of increasing any desirable form; these should be inserted in sandy soil, in August, and kept shaded under handlights, or in cold frames, during bright sun, until rooted. The golden varieties, and those of weeping habit, are frequently grafted on tall stems of the common upright type. Layering may also be advantageously resorted to.

T. baccata (berried). Common Yew. *fl.*, male catkins ¼in. long; females minute. March. *fr.* ½in. long, rounded, with a red, mucilaginous cup. *l.* linear, more or less falcate, acute, ½in. to 1½in. long, coriaceous, shining above, paler beneath. Trunk 15ft. to 50ft. high, sometimes as much as 27ft. in girth, channelled;

FIG. 10. TAXUS BACCATA DOVASTONI.

flexible and elastic, was in olden times in great request for the manufacture of bows. The branches are fre-

branches spreading. Europe (Britain), India, &c. Tree. See Fig. 8. The following varieties are enumerated by Gordon, in "The Pinetum":

Taxus—*continued.*

T. b. adpressa (adpressed).* *fr.* like that of the type, but somewhat smaller. *l.* oblong or bluntly oval, rounded at both ends on the lesser branchlets, but much longer and more pointed on those of the leading shoots, more or less distichous, flat, rather distant, on very short footstalks, decurrent, mostly spiny-pointed, two to four lines long, dark glossy-green above, glaucous below. Branches numerous, much divided, horizontally spreading, sometimes in whorls; lateral ones and branchlets distichous. *h.* 6ft. to 8ft. A dense, spreading, depressed bush, raised from seed in the nursery of Messrs. Dickson, of Chester, more than half a century ago. See Fig. 9. SYNS. *T. tardiva, Cephalotaxus tardiva.* There is a form, *erecta*, of upright habit.

T. b. argentea (silvery). *l.* striped with silvery-white, sometimes changing to straw-colour. A very handsome variety.

T. b. cheshuntensis (Cheshunt). This variety is intermediate between the type and *T. b. fastigiata.*

T. b. Dovastoni (Dovaston's).* Principal branches horizontal or pendent; branchlets quite drooping. A very striking variety. In the form *variegata*, all the leaves, when young, are broadly edged with golden-yellow, but, when fully matured, they change to a bright green, edged with silvery-white. See Fig. 10.

T. b. elvastonensis (Elvaston). *l.* on the young parts of the plant entirely of a bright orange-colour.

T. b. epacrioides (Epacris-like). *l.* light green, small. A pretty, dwarf, somewhat spreading variety.

T. b. erecta (erect).* Fulham Yew; Upright Common Yew. A slender variety, with smaller foliage than the type, but with a much stiffer and more erect habit. *Crowderi* is a form differing very slightly from this.

T. b. ericoides (Heath-like). *l.* dark green, very small. Twigs short, erect, slender. A slender, slow-growing variety, 1ft. to 2ft. high. SYN. *T. empetrifolia.*

T. b. fastigiata (pyramidal).* Irish or Florence Court Yew. *fr.* oblong. *l.* in tufts, or scattered along the branchlets, not two-rowed as in the type. Branches erect, closely compressed, forming a pyramidal or broom-shaped head. A very distinct and singular variety, of which the following are forms: *aurea variegata*, with golden-variegated leaves; *variegata*, having a portion of the foliage striped and margined with silvery-white or pale straw-coloured blotches.

T. b. Foxii (Fox's). *l.* much smaller and darker than in the type. A very dwarf kind, not exceeding 2ft. in height.

T. b. fructu-luteo (yellow-fruited).* *fr.* of a beautiful golden-yellow, very handsome.

T. b. glauca (glaucous). *l.* dark green above, bluish or glaucous-grey on the under part. Bark on the young shoots rusty-brown. A very vigorous kind.

T. b. Jacksoni. Jackson's Weeping Yew. *l.* light green, broad, all more or less incurved, falcate, and thickly covering the upper part of the branches. Branchlets reddish-brown, numerous, short, obliquely placed, and more or less curved. A nice, pendulous kind.

T. b. nana (dwarf). *l.* longer, and of a darker and more glossy-green, than those of the type. A very desirable variety, forming a dwarf, dense, conical bush.

T. b. nidpathensis (Nidpath Castle). A form rather columnar than pyramidal in habit, and having a tendency to spread at the top.

T. b. recurvata (recurved). *l.* longer and straighter than those of the species; the margins involute. Branches long and straggling, spread out and little divided, but often reflected.

T. b. sparsifolia (sparse-leaved). *l.* dispersed round the branches, as in the Irish Yew. Branches spreading.

T. b. variegata (variegated). *l.* mostly edged with golden-yellow. A very handsome variety. *Barroni* is a fine fruit-bearing form.

T. b. Wallichiana (Dr. Wallich's). *l.* deep glossy-green, much paler and not glossy below. Branches long, slender, spreading, light brown; branchlets more or less pendent. Gordon accords this specific rank.

T. brevifolia (short-leaved). Western or Californian Yew. *fr.* resembling that of the Irish Yew. *l.* distichous, flat, narrow, acute-pointed, somewhat curved on the branchlets, but more or less scattered on the leading shoots and principal branches, ¾in. to 1in. long, linear-falcate, rarely straight, glossy yellowish-green, glaucous beneath, with a yellowish footstalk one line long. Branches slender, very long, pendulous, with yellowish bark. *h.* 30ft. to 40ft. California. A handsome tree. SYN. *T. Lindleyana.*

T. canadensis (Canadian). American Yew; Ground Hemlock. *fr.* resembling, but much smaller than, that of the common Yew. *l.* linear, crowded, rather narrow, mostly straight, somewhat distichous, revolute on the edges, decurrent at base, on very short footstalks, abruptly tapering at the apex, spiny-pointed, ¾in. to 1in. long, glossy pale yellowish-green above, slightly rusty beneath. Branches slender, horizontally spreading, seldom ascending; branchlets distichous. *h.* 3ft. to 4ft. North America, 1800. A spreading bush.

Taxus—*continued.*

T. c. variegata (variegated). *l.* at the ends of the young shoots whitish; those lower down more or less margined with white; mature ones as in the type.

T. cuspidata (abrupt-pointed).* *l.* linear, curved upwards, alternate, stiff, scattered but somewhat distichous on the leading shoots, denser on the branchlets, ¾in. to 1in. long, on rather long footstalks, broadly decurrent at base, abruptly spine-pointed, deep glossy-green above, pale yellowish-green beneath, but not glaucous. Branches numerous, spreading; branchlets rather stiff, angular. *h.* 15ft. to 20ft. Japan. A large, handsome bush.

T. empetrifolia (Empetrum-leaved). A synonym of *T. baccata ericoides.*

T. Fortunei (Fortune's). A synonym of *Cephalotaxus pedunculata fastigiata.*

T. globosa (globular-seeded). Mexican Yew. *fl.* lateral and solitary on the under side of the branchlets. *fr.* with globular seeds. *l.* linear, slightly curved or falcate, narrow, closely placed, distichous, tapering to both ends, spiny-pointed, ¾in. to 1in. long, on rather long, twisted footstalks, decurrent at base, dark glossy-green above, very much paler beneath. Branches long, spreading, much divided; branchlets more or less drooping at the points, mostly forked. Mexico. A handsome, large bush or small tree.

T. Lindleyana (Lindley's). A synonym of *T. brevifolia.*

T. Makoya (Makoy's). A synonym of *Podocarpus chinensis.*

T. tardiva (tardy). A synonym of *T. baccata adpressa.*

T-BUDDING. Another name for Shield-budding, one of the principal methods adopted for propagating by budding. For the insertion of the bud, the stock is cut in a longitudinal direction, and then again transversely at the upper extremity of the cut, somewhat in the shape of the letter T. In Inverted T-budding the transverse cut is made at the lower instead of the upper end, thus ⊥, and the bud inserted from that point upwards. *See* **Budding.**

TEA BERRY, or **CANADA TEA.** *See* **Gaultheria procumbens.**

TEA, BOTANY BAY. *See* **Smilax glycyphylla.**

TEAK-TREE, AFRICAN. *See* **Oldfieldia africana.**

TEAK-TREE, INDIAN. *See* **Tectona grandis.**

TEAK-TREE, NEW ZEALAND. *See* **Vitex littoralis.**

TEA, PARAGUAY. *See* **Ilex paraguariensis.**

TEA-PLANT. *See* **Camellia theifera.** The name is also applied to many other plants.

TEASEL, TEAZEL, or **TEAZLE.** *See* **Dipsacus.**

TEATED. Resembling the figure of an animal's teat.

TECOMA (an abridgment of the Mexican name, *Tecomaxochitl*). Trumpet Creeper; Trumpet Flower. Including *Campsidium* and *Pandorea.* ORD. *Bignoniaceæ.* A genus embracing about two dozen species of stove, greenhouse, or hardy, erect and arborescent, twining, climbing, or radicant shrubs, dispersed over the warmer and sub-temperate regions of the globe. Flowers often fulvous, red, or orange, racemose or panicled at the tips of the branches; calyx tubular-campanulate, sub-equally five-toothed; corolla tube elongated, straight or incurved, sometimes slightly enlarged or sub-ventricose, sometimes dilated in an ample, campanulate throat; limb sub-bilabiate, the five lobes scarcely unequal, broad, erecto-patent or widely spreading; stamens four, didynamous, affixed below the middle of the tube, included or exserted. Capsule linear or narrowly elliptic, often acute at both ends, straight or incurved. Leaves opposite or rarely scattered, pinnate or undivided; leaflets often toothed. Tecomas succeed best in well-drained, loamy soil; they require very liberal supplies of water during summer, but should be kept moderately dry at the roots in winter. The plants grow vigorously under ordinary treatment; but, in order to insure their free flowering, the wood must be thoroughly ripened by being exposed to sunlight

Tecoma—*continued.*

and air during the period of growth. The stove species may be grown in heat all the summer, and ripened by being kept cooler in autumn. Those succeeding in a greenhouse may have plenty of light and air through the summer. *T. radicans*, when planted out of doors, should be trained to a wall with a south aspect. Propagation is effected by root-cuttings, by cuttings of the young or partially-ripened shoots, or by layering. A selection of the best-known species is given below. Several others, formerly included here, will be found under **Tabebuia.**

T. australis (Southern).* Wonga-Wonga Vine. *fl.* in loose, terminal panicles; corolla yellowish-white, tinged inside with purple or red, the tube ½in. to ⅔in. long, the lobes broad, not one-third as long as the tube. June. *l.*, leaflets usually five to nine, ovate-oblong to almost linear, entire or here and there coarsely crenate, variable, 1in. to 3in. long. Australia, 1793. A tall, woody, half-hardy climber. (B. 8.) Syns. *T. diversifolia*, *Bignonia Pandorea* (A. B. R. 86; B. M. 865).

T. austro-caledonica (South Caledonian). *fl.* small; cymes opposite, compound; panicles terminal. Summer. *l.* imparipinnate, two or three-jugate, the upper ones trifoliolate; leaflets very broadly elliptic, obtuse, with two to four teeth below the acumen, sometimes nearly round. New Caledonia, 1870. A graceful climber.

T. capensis (Cape).* *fl.* clustered, in pedunculate racemes; corolla orange-scarlet, 2in. long, incurved; stamens exserted. August. *l.* imparipinnate, four-jugate; leaflets ovate, serrated. *h.* 15ft. Cape of Good Hope, 1823. A half-hardy, glabrous climber. (B. R. 1117; L. B. C. 1672.)

T. chrysantha (golden-flowered). A synonym of *Tabebuia chrysantha.*

T. diversifolia (variable-leaved). A synonym of *T. australis.*

T. filicifolium (Fern-leaved).* *l.* opposite, imparipinnate, 5in. long, including the petioles, bearing considerable resemblance to the fronds of some of the small, slender, pinnate Ferns; leaflets nine to twelve pairs, small, ovate, deeply cut into two or three lobes on each side, the larger lobes being sometimes also toothed. Stem slight, woody. Fiji Islands, 1874. A very elegant, stove climber. Syn. *Campsidium filicifolium* (F. & P. 1874, p. 280).

Fig. 11. Flowering Branch of Tecoma radicans.

Tecoma—*continued.*

T. fulva (fulvous). *fl.* on bibracteate pedicels, seven to nine in a raceme; corolla fulvous outside, yellow within, 1½in. long. July. *l.* scattered, imparipinnate, multijugate; leaflets cuneate-ovate, sub-sessile, serrated at apex, villous when young, afterwards glabrous; petioles articulated. Branches terete, glabrous. *h.* 15ft. Peru, 1855. An erect, stove shrub. (B. M. 4896; F. d. S. 1116.)

T. grandiflora (large-flowered).* *fl.* in a terminal panicle; corolla scarlet, shorter and broader than that of *T. radicans*, the tube scarcely longer than the calyx; pedicels drooping, biglandular. July. *l.* imparipinnate; leaflets three to five-jugate, ovate, acuminate, with tooth-like serratures. *h.* 30ft. Japan and China, 1800. A glabrous, greenhouse climber. Syn. *Bignonia grandiflora* (A. B. R. 493; B. M. 1398; F. d. S. 1124-25).

T. jasminioides (Jasmine-like).* *fl.* in compact, terminal, corymbose panicles; corolla white, streaked with red in the throat, the tube above 1in. long, the very broad lobes more than ½in. long. August. *l.*, leaflets usually five or seven, ovate and acuminate or ovate-lanceolate, 1in. to 2in. long, all entire. *h.* 20ft. Australia. A glabrous, greenhouse climber. (B. M. 4004; B. R. 2002; P. M. B. vi. 199.)

T. mirabilis (wonderful). A garden synonym of *T. valdiviana.*

T. mollis (soft). *fl.* in a terminal panicle; corolla yellow or reddish. July. *l.* imparipinnate; leaflets four-jugate (in some forms, the upper leaves only one or two-jugate), oblong, acuminate, nearly entire, slightly serrated at apex, velvety on both sides. Branches compressed-terete. *h.* 6ft. Mexico, Colombia, Peru, and Chili, 1824. A softly pubescent-tomentose, erect, greenhouse shrub.

T. radicans (rooting).* Common Trumpet Flower. *fl.* in terminal corymbs; corolla scarlet-red, 2in. to 3in. long, the tube thrice as long as the calyx. Summer. *fr.* stipitate, 3½in. long. *l.* imparipinnate; leaflets four or five-jugate, ovate, acuminate, dentate-serrate, puberulous at the sides of the nerves beneath. *h.* 25ft. North America, 1640. A hardy shrub, climbing by aërial rootlets. See Fig. 11. Syn. *Bignonia radicans* (B. M. 485). The variety *minor* has narrower flowers of a beautiful scarlet colour.

T. rosæfolia (Rose-leaved). *fl.* in terminal, sub-spicate racemes; corolla yellow, glabrous, funnel-shaped. July. *l.* imparipinnate; leaflets bijugate, oblong, obtuse, serrated. Branches terete, somewhat striated. *h.* 6ft. South America. An erect, stove shrub.

T. sambucifolia (Elder-leaved). *fl.* in a terminal panicle; corolla yellow, funnel-shaped. July. *l.* imparipinnate; leaflets two or three-jugate, oblong, acuminate, serrated. Branches slightly compressed. *h.* 6ft. Peru, 1824. A glabrous, erect, stove shrub.

T. serratifolia (serrate-leaved). A synonym of *Tabebuia serratifolia.*

T. spectabilis (showy). A synonym of *Tabebuia spectabilis.*

T. stans (standing). Yellow Elder. *fl.* racemose or paniculate; corolla yellow, 1½in. long. Summer. *l.* imparipinnate; leaflets five to eleven, lanceolate, acuminate, deeply serrated. Branches terete. *h.* 12ft. West Indies and Mexico to Peru, &c., 1730. An erect, glabrous, greenhouse shrub. (B. M. 3191.)

T. s. apiifolia (Apium-leaved). *l.*, leaflets deeply incised, nearly pinnatifid. Mexico. Stove. Syn. *Bignonia incisa* (of gardens).

T. undulata (waved). *fl.*, corolla orange-coloured, ample, campanulate; racemes few-flowered, terminating the lateral branchlets. Summer. *l.* petiolate, simple, linear-lanceolate, obtuse, undulated, entire, often nearly alternate, 6in. to 7in. long; petioles nearly 1in. long. India and Arabia. A tall, erect, glabrous, stove shrub. Syn. *Bignonia undulata* (S. E. B. 19).

T. valdiviana (Valdivian). *fl.* four to nine in simple, terminal racemes; corolla orange-coloured, villous within towards the base. Spring. *l.* imparipinnate; leaflets nine to fifteen, ovate-oblong or elliptic, often mucronate, the margins toothed or nearly entire, pale beneath. Branches angular. Chili, 1870. A climbing, stove shrub. Syns. *T. mirabilis* (of gardens), *Campsidium chilense* (G. C. 1870, 1182).

TECOPHILÆA (named after Tecophila, the daughter of Billotti, a botanist). Syns. *Distrepta*, *Phyganthus*, *Pœppigia.* Ord. *Hæmodoraceæ.* A small genus (two species) of greenhouse, bulbous plants, natives of Chili. Flowers on rather long pedicels; perianth shortly and narrowly tubular above the half-inferior ovary, the lobes much longer, obovate-oblong, flat, sub-equal; scape included at base within a sheath with the leaves, otherwise leafless, one or loosely few-flowered. Leaves radical, few or solitary, spreading, linear or lanceolate, the base included in a long, scarious sheath. *T. cyaneo-crocea*, the only species yet introduced, thrives in a compost of

Tecophilæa—*continued.*

rich, sandy loam. The bulbs should be kept dry during their season of rest. Propagation may be effected either by seeds or by offsets.

T. cyaneo-crocea (blue-and-yellow). Chilian Crocus. *fl.*, perianth of a beautiful blue, with a whitish throat, 1¼in. to 1½in. long, the segments obovate, many-nerved; peduncles one to three, erect, simple, one-flowered, ebracteate, 1in. to 2in. long. *l.*, produced radical ones two or three, linear, acuminate, channelled, undulated, 3in. to 6in. long, ¼in. to ½in. broad. 1872.

T. c.-c. Regelii (Regel's). *fl.*, perianth segments narrower than in the type, 1in. long, oblong; peduncles longer. *l.* narrower, not undulated. (R. G. 718, under name of *T. cyaneo-crocea.*)

TECTONA (*Tekka* is the Malabar name of *T. grandis*). Teak. SYN. *Theca.* ORD. *Verbenaceæ.* A small genus (three species) of very valuable, lofty, stove, Asiatic timber-trees. Flowers white or bluish, small, in dichotomous cymes, forming an ample, terminal panicle; calyx campanulate, shortly five or six-cleft. Leaves opposite or ternately whorled, ample, entire. The wood of *T. grandis* (Indian Teak-tree) is very valuable, and is largely employed in ship-building. This species has been introduced to our stoves; but, as it reaches a height of 80ft. to 150ft., it is scarcely likely to find accommodation for its development in this country.

TEEDIA (called after J. G. Teede, a German botanist and traveller, who died in Surinam). SYN. *Borkhausenia.* ORD. *Scrophularineæ.* A small, South African genus (two species) of greenhouse, glabrous or pubescent shrubs. Flowers pink, rather small; calyx deeply five-cleft; corolla tube cylindrical, the limb of five short, rounded, sub-equal, spreading lobes; stamens four, didynamous; peduncles cymosely few-flowered in the upper axils, forming a terminal, leafy thyrse. Leaves opposite, entire. The species are rather pretty subjects when in flower. A light, rich soil is most suitable. Propagation may be effected by seeds, or by cuttings.

T. lucida (clear). *fl.*, corolla four to five lines long; peduncles ⅛in. to ¾in. long, three to seven-flowered. April. *l.* ovate or ovate-lanceolate, narrowed at base and embracing the stem, 1in. to 4in. long, clear-surfaced, acute, serrulated. Branches tetragonal. *h.* 2ft. 1774. Plant glabrous. (B. R. 209.)

T. pubescens (downy). *fl.*, corolla ½in. long. May. *l.* ovate or elliptic, often broader than those of *T. lucida*, rounded or narrowed at base, clasping the stem. *h.* 2ft. 1816. Plant rusty-pubescent or villous. (B. R. 214.)

TEESDALIA (named after Robert Teesdale, a Yorkshire botanist, author of "A Catalogue of Plants growing about Castle Howard"). ORD. *Cruciferæ.* A genus consisting of two species of glabrous, hardy, annual herbs, with minute, white flowers, and rosulate leaves. They are natives of Western Europe, the Mediterranean region, and Asia Minor. *T. nudicaulis* (Pepper Cress) is a common British weed.

TEETH. Any kind of small divisions.

TEGANIUM. A synonym of **Nolana** (which *see*).

TELANTHERA. Included, for garden purposes, under **Alternanthera** (which *see*). It is kept up as a distinct genus by Bentham and Hooker.

TELEGRAPH-PLANT. A common name for **Desmodium gyrans** (which *see*).

TELEIANTHERA. A synonym of *Telanthera.*

TELEKIA. Included under *Buphthalmum.*

TELEPHIUM (the old Greek name used by Hippocrates for a similar plant, perhaps named after Telephus, son of Hercules, by Auge). Orpine. ORD. *Ficoideæ.* A genus embracing one (or three) species of hardy, diffuse, often perennial herbs, inhabiting the Mediterranean region. Flowers white, small, in terminal, sub-capitate cymes; sepals, petals, and stamens five each. Leaves alternate, twin, or opposite, ovate or oblong, obtuse or acute, nerveless. *T. Imperati* (Tree Orpine) has been introduced, but is not worth cultivating.

TELFAIRIA (so called after Charles Telfair, 1778-1833, an Irish botanist, who died in the Mauritius). SYNS. *Ampelosicyos, Joliffia.* ORD. *Cucurbitaceæ.* A small genus (two species) of stove, climbing shrubs, natives of tropical Africa. Male flowers mediocre or rather large, on bracteate pedicels, racemose; calyx tube short, the lobes lanceolate, serrated or crenate; corolla pale purple, rotate, five-parted, the segments fringed with elongated tendrils; stamens three. Female flowers solitary; rudimentary stamens wanting; ovary oblong, tumid and lobed at the base, three to five-celled. Fruit large, orbicular, compressed; seeds edible. Leaflets three or five, oblong, auricled at base, repand-toothed or cut. By pressure, the seeds of *T. pedata* yield an excellent bland oil, and they are said to be, when fresh, as palatable as almonds. Telfairias produce their handsome flowers in great profusion, but require a large space to grow in, and to be frequently pruned before flowering. Sandy loam and a little peat form a desirable compost for the plants. Cuttings of the flowering shoots should be taken, and inserted in soil or sand, under a glass, in heat, where they will readily root.

T. occidentalis (Western). *fl.* 1½in. to 2in. in diameter; corolla white, with a purple eye; stamens five; male racemes 1ft. long, six to ten-flowered. September. *fr.* yellow-green, 2ft. long, with ten thick wings 1in. deep, and flesh of golden-yellow pulp. *l.* alternate, petiolate, pedately five-foliolate; leaflets 3in. to 6in. long, shortly petiolulate, elliptic-ovate, obtusely acuminate, sinuate-toothed. Tendrils bifid. West Africa, 1870. (B. M. 6272.) Said to be cultivated for the seeds, which the negroes boil and eat.

T. pedata (pedate-leaved). *fl.* 1in. or more long; calyx downy, large; corolla purplish; male racemes six to eight-flowered; peduncles 6in. to 8in. long. July. *fr.* always green, 1½ft. to 3ft. long, often 8in. across, with ten to twelve deep furrows; seeds the size of a very large kidney bean. Zanzibar, 1825. (B. M. 2751-2.) SYNS. *Feuillæa pedata* (B. M. 2681), *Joliffia africana.*

TELIPOGON (from *telos*, the summit, and *pogon*, a beard; the column is bearded to its summit). SYN. *Thelypogon.* ORD. *Orchideæ.* A genus embracing about forty species of stove, epiphytal Orchids, natives of the Andes of Columbia and Peru: it is doubtful, however, whether many of them are specifically distinct. Flowers few at the apex of the peduncle, loosely racemose, showy; sepals sub-equal, free, much spreading, narrow; petals much broader; lip sessile, much spreading, undivided, rarely small; column very short and thick, setose or hispid; pollen masses four; peduncles pseudo-terminal, rather long, erect, simple. Leaves distichous, short, coriaceous or fleshy. Only one species calls for description here. It does best in small baskets full of peat fibre, potsherds, and sphagnum, or attached to a piece of teak, with a little fresh sphagnum wired over the base of the plant.

T. Crœsus (Crœsus). *fl.* yellow, with a dark network, 1½in. in diameter; sepals triangular, acuminate, aristate, three-nerved, carinate outside on the middle nerve; petals cuneate, rhomboid, obtuse-angled, five-nerved; lip very broad, flabellate, rounded, many-nerved, the base velvety. *l.* distichous. Stems narrow and thin. Columbia, 1877.

TELLIMA (an anagram of *Mitella*, under which this genus was formerly included). ORD. *Saxifrageæ.* A genus embracing half-a-dozen species of hardy, erect, pilose or glandular, annual or perennial herbs, natives of North-west America. Flowers greenish or white, pedicellate, bracteolate, nodding; calyx tube ample, the limb five-toothed or five-cleft; petals five, rarely reddish, inserted at the mouth of the calyx, entire, trifid, or pinnatifid; stamens ten; racemes terminal, elongated, many-flowered. Leaves petiolate, roundish-cordate, lobed, toothed; stipules wanting, or adnate with the base of the petioles. *T. grandiflora*, the only species known to cultivation, is a handsome perennial. For culture, *see* **Mitella.**

T. grandiflora (large-flowered). *fl.* greenish, about ½in. long and broad; petals laciniate-pinnatifid, sessile; raceme somewhat spicate. April. *l.* palmately-lobed, cut-toothed; cauline ones

Tellima—*continued.*

similar, two to four, alternate; petioles somewhat stipuliform at base. Stem stout, about 2ft. high. 1826. Plant hirsute. (B. R. 1178.)

TELOPEA (from *telopas*, seen at a distance; alluding to the great distance from which the crimson flowers are discernible in its native country). SYN. *Hylogyne.* ORD. *Proteaceæ.* A genus comprising two or three species of tall, greenhouse shrubs, endemic in Australia. Flowers red, showy, on twin pedicels, densely racemose; perianth slightly irregular, the tube open early on the under side, tapering and recurved under the limb, the laminæ oblique, broad; racemes terminal, sub-globose or ovoid, surrounded by an involucre of imbricated, coloured bracts, the bracts within the raceme small. Follicles stipitate, oblique, recurved. Leaves alternate, entire or toothed. *T. speciosissima*, the only species yet introduced, is one of the most beautiful plants in the order to which it belongs. It requires a temperature rather warmer than that of an ordinary greenhouse; but a very moist atmosphere encourages a too vigorous growth, which is not conducive to floriferousness. Water may be applied freely in summer, but the roots should be kept nearly dry in winter. A well-drained border or bed of sandy loam is most suitable for the reception of this plant. Propagated by layering suckers during winter, in small pots, and allowing them to remain until rooted in the pots before being detached.

T. speciosissima (very showy). Waratah; Warratau. *fl.* crimson; perianth glabrous, about 1in. long; pedicels thick, recurved, ¼in. to ½in. long; head or raceme dense, about 3in. in diameter; involucral bracts ovate-lanceolate, the inner ones 2in. to 3in. long. June. *fr.* 3in. to 4in. long, containing ten to twenty seeds. *l.* cuneate-oblong or almost obovate, 5in. to 10in. long, mostly toothed in the upper part, tapering into rather long petioles, a few rarely quite entire. *h.* 6ft. to 8ft. 1789. (G. C. n. s., xvii., p. 677; B. M. 1128, under name of *Embotrium speciosissimum.*)

TEMPERATURE. A study of the ever-varying Temperatures daily experienced, and their effect on cultivated plants, forms an important part of the duties of every gardener who has under his charge anything beyond that which is of the hardiest description. Temperatures, it need scarcely be remarked, often fluctuate very suddenly from what is called one extreme to the other; and, as their guidance is beyond human control, it becomes a necessity on the part of cultivators to prevent such changes, so far as possible, from injuriously affecting plants, by giving constant attention, and anticipating what is likely to ensue. The degree of intensity of heat or cold is ascertained by the expansion or contraction of the mercury or spirit in a thermometer. From knowledge gained by experience, the extreme Temperatures that a large number of plants will withstand with impunity is often known, but there are exceptional cases where other conditions are unfavourable, and plants succumb in spite of all precautions. To know the Temperature in which various exotics succeed best, and the proper degree of heat requisite for bringing them to perfection, is one of the first essentials towards success. The maintenance of an equable Temperature in forcing operations, and in the culture of fruits under glass, is of great importance, as on it depends most materially the development of fruit or flowers, as the case may be. Forcing indoors is most intimately connected with, and dependent upon, the regulation of Temperature by means of the heating apparatus and the proper use of the ventilators when necessary. To know the country to which any given plant is indigenous, or to ascertain from a reliable source the degree of hardiness to which it may be subjected, is often a good guide in giving it proper treatment as regards the amount of heat required. But this is totally insufficient in dealing with the varied occupants of a large garden, and in conducting forcing operations in seasons when outside Temperatures often fluctuate very rapidly. Practical experience and unremitting attention are absolutely

Temperature—*continued.*

essential for good gardening, and, even when these are intelligently exercised in daily management, the operator finds there are many things beyond his control, sudden changes in the Temperature being amongst the most formidable.

TEMPLES. Architectural buildings, usually erected in extensive pleasure-grounds to form distinct, attractive features in themselves, and sometimes to afford resting-places or places of shelter. Temples found in many extensive gardens that have long been established, built of similar massive material, in proportion, to that of the mansion, are the best to imitate when this style of embellishment is desired. In any case, the material used should be of the most durable description; the shapes most generally adopted are circular, octagonal, and oblong. Occasionally, an elevated point or some position at the end of a walk will present itself, and appear to indicate the very place for a Temple, but these buildings need be, as a rule, but sparingly introduced. They are invariably expensive to erect.

TEMPLETONIA (named in honour of John Templeton, an Irish botanist). Including *Nematophyllum.* ORD. *Leguminosæ.* A genus embracing seven species of Australian, glabrous, greenhouse shrubs or under-shrubs, occasionally leafless. Flowers red or yellow, axillary, solitary or two or three together; two upper calyx lobes or teeth united or rarely distinct; standard orbicular or obovate, usually reflexed; wings narrow; stamens all united in a sheath open on the upper side; bracts usually very minute. Leaves (when present) alternate, simple, entire; stipules minute or spinescent. *T. retusa*, the only species introduced, is an interesting plant, thriving in a mixture of sandy loam and peat. It may be increased by young cuttings, inserted in sand, under a glass.

T. glauca (glaucous). A synonym of *T. retusa.*

T. retusa (retuse-leaved). Coral Bush. *fl.*, petals red or rarely white, 1in. to 1¼in. long, all narrow, on short claws, and of nearly equal length; pedicels rigid, with obtuse bracteoles near the middle. March to June. *l.* broadly obovate to narrowly cuneate-oblong, less than ¾in. to above 1in. long, obtuse, emarginate, or minutely mucronate, nearly sessile or shortly petiolate. *h.* 3ft. or more. 1803. (B. M. 2334; B. R. 383; L. B. C. 525.) SYN. *T. glauca* (B. M. 2088; B. R. 859; L. B. C. 644).

TENAGEIA. Included under *Juncus.*

TENARIS (said to be the native name in South Africa). ORD. *Asclepiadeæ.* A small genus (two species) of greenhouse, erect, slender, nearly simple, perennial herbs, natives of South Africa. Flowers pink or whitish, cymose; calyx deeply five-cleft, the lobes acute; corolla tube shortly campanulate, the lobes five, long, linear-spathulate; coronal scales ten, affixed to the new staminal tube; stamens affixed at the base of the corolla, the filaments connate in a short tube. Leaves opposite, narrow-linear. Only one of the species has been introduced. For culture, *see* **Ceropegia.**

T. rostrata (beaked). *fl.*, corolla whitish, densely covered towards the base with minute, purple dots, ⅔in. in diameter, rotate; outer corona of five small, yellowish lobes; inner one of five pinkish segments; peduncles one (or two ?) flowered, three to five lines long. *l.* about four pairs, distant, linear, acute, 2in. to 3in. long, ⅛in. broad, arched. Stem 1½ft. high, slender. East tropical Africa, 1885.

TENDANA. A synonym of **Micromeria** (which *see*).

TENDRIL. The twisting, thread-like process by which some plants lay hold of others; *e.g.*, the Vine.

TENTHREDINIDÆ, or **SAWFLIES.** A family of **Hymenoptera** (which *see*), of very great interest to gardeners, because of the damage the insects do to various cultivated trees, shrubs, and herbs. The name Sawfly refers to the most characteristic feature of the

Tenthredinidæ—*continued.*

family, viz., the existence in the female of an organ, very like a minute double saw, at the hinder end of the body. The saw is a modified ovipositor, and is made up of two blades, each of which consists of a support along the back, and of the cutting portion, or saws strictly so called, secured to it along one side. The two saws are quite like one another. In each the edge is toothed, and has cross-bars, which are often furnished with minute teeth, and thus it combines the action of a saw with that of a file. The toothing and bars of the saws differ in the various species of Sawflies. They are protected, when not in use, in a two-jointed sheath. Sawflies, for the most part, have moderately broad bodies, with the abdomen united to the thorax by its full width; differing in this from most *Hymenoptera*, which have the abdomen fixed to the thorax by a slender stalk. The head is always broader than long, but is not broader

FIG. 12. ERIOCAMPA LIMACINA—*lc*, Lanceolate Cell in the Front Wings; *a*, Line showing the actual spread of Wings.

than the thorax. *Eriocampa limacina* (see Fig. 12) represents the majority of the group in form and general appearance. The body is usually smooth, sometimes hairy, and seldom marked with punctures. The colour is generally black or some dark shade, often with a metallic lustre; sometimes, it is coppery-green, blue, pure green, yellow, or red. The legs are often rusty-red, even when the body is some other colour; they are of fair size in proportion to the body, and have all their parts well developed. Each bears two sharp spurs near the tip of the tibia. The wings are of much the same structure as in other *Hymenoptera*; but the venation is characteristic in so far that one of the cells near the hind margin of each front wing, known as the "lanceolate cell" (*lc*, Fig. 12) is found in no other *Hymenoptera*. Generally, the wings are transparent, and more or less iridescent. The parts of the mouth are fitted for cutting vegetable structures.

FIG. 13. LARVÆ OF ROSELEAF SAWFLY.

There is usually a little difference in aspect between the sexes, due to slight modifications of the limbs, the body, and the organs of the head.

Sawflies abound from May till the end of July; and of some species a second brood appears in autumn. The mature insects are of sluggish habits, and, in dull weather, sit on the herbage, without change of position, for hours at a time. A few species are comparatively active, especially in bright weather. Sawflies frequent flowers, both to obtain honey or pollen, and to feed on the minute insects that are there found. They are partial to shallow, open flowers, *e.g.*, Buttercups and *Umbelliferæ*. The larvæ live on plants. The eggs are laid on leaves, frequently along the lower surface of the veins, or on twigs. In either case, the mother makes a slit for each egg with her saws. Many Sawflies have been found to be parthenogenetic, the females producing fertile eggs without the aid of the males, which, indeed, in some species are still unknown.

Tenthredinidæ—*continued.*

The habits of the larvæ vary greatly. Most of them feed exposed on the surface or edge of a leaf, some species

FIG. 14. SLUGWORM, THE LARVA OF ERIOCAMPA LIMACINA.

in groups, others singly (see Figs. 13 and 14). Some (*Lyda*) spin silken webs, in which many live, each larva in its own tube, sheltered in the common web. A few live in leaves rolled or folded by themselves to afford them protection. Others bore into twigs. Some are leaf-miners, and others burrow into fruits. A considerable number of species make galls in stems or leaves; many of the gall-makers abound on Willows. The forms of the larvæ vary with their modes of life; but by far the most species have a cylindrical body. A very common position, when at rest or feeding, is to have the front half of the body straight, and the hinder segments rolled spirally inwards (see Fig. 13). In general appearance, the larvæ closely resemble those of many Night Moths, or *Noctuæ*, having, like these, three pairs of true legs, and several pairs of prolegs; but they differ in the number of the latter, often having from six to eight pairs, instead of five pairs, as in *Noctuæ*, and the fifth segment always bears prolegs (if any exist) in Sawfly larvæ, but never in the larvæ of the *Noctuæ*. Sawfly larvæ are protected by their inconspicuous form and colour, or by dropping to the ground, if danger threatens, or by disagreeable excretions on the surface of the body. Some, *e.g.*, Slugworms (see Fig. 14), excrete slimy substances, others bear a flaky coating, &c. Brightly-coloured kinds are mostly protected by disagreeable excretions. Most of them pupate in silken or earthen cocoons, under soil, in crevices, or in other sheltered places.

The more injurious species of Sawflies, and the remedies most effectual against each, will be found discussed at greater length under the following heads: **Gooseberry and Currant Sawfly, Lophyrus, Lyda, Nematus, Pine Sawflies, Slugworms,** and **Turnip Sawfly.**

TENTHREDO CERASI. An old name for *Eriocampa limacina*. *See* **Slugworms.**

TENTHREDO GROSSULARIÆ. A name formerly given to the **Gooseberry and Currant Sawfly** (which *see*).

TEPHRITIS ONOPORDINIS. *See* **Celery Fly.**

TEPHRO. A term which, used in Greek compounds, signifies ash-grey.

TEPHROSIA (from *tephros*, ash-coloured; alluding to the colour of the leaves). North American Hoary Pea. Including *Requienia.* ORD. *Leguminosæ.* A large genus (about ninety species) of stove, greenhouse, or half-hardy herbs, sub-shrubs, or rarely shrubs, broadly dispersed over the warmer regions of the globe. Flowers red, purple, or white, in leaf-opposed racemes, or solitary or in pairs in the axils; calyx tube campanulate, the teeth distinct, sub-equal; petals clawed; standard sub-orbicular; keel incurved, not beaked; stamens diadelphous. Pods flattened, two-valved. Leaves usually odd-pinnate; leaflets opposite, often silky beneath. Several of the species are economically valuable, but few of them are very ornamental. A selection from those introduced is here given. All thrive in a compost of sandy peat and leaf mould. Propagation may be readily effected by seeds; or by cuttings, inserted in sand, under a bell glass, those of the stove species in heat.

T. candida (whitish). *fl.* reddish or white, ⅜in. to 1in. long; standard densely silky; racemes copious, terminal and lateral, elongated, 6in. to 9in. long. July. *l.* shortly petiolate, 6in. to 9in. long; leaflets nineteen to twenty-five, ligulate, acute, 1½in. to 2in. long. India, 1816. A low, stove shrub.

T. capensis (Cape).* *fl.* purple, ¼in. long, the standard pubescent; racemes interrupted, attenuated, distantly many-flowered; peduncles elongated, slender. July. *l.* rather long-petiolate; leaflets three to six pairs, elliptic, cuneate-oblong, or lanceolate, obtuse or acute. Stems procumbent or trailing, 2ft. to 3ft. long. South Africa, 1825. Greenhouse sub-shrub.

T. grandiflora (large-flowered). *fl.* red, fulvescent on the outside, eight to ten lines long; peduncles terminal and leaf-opposed, fasciculate-corymbose at summit. June. *l.* shortly petiolate; leaflets five or seven pairs, cuneate or linear-oblong, obtuse or acute, retuse or mucronulate. *h.* 1ft. to 2ft. South Africa, 1774. An erect, greenhouse shrub. (B. R. 769, under name of *Galega grandiflora.*)

T. pallens (pale). *fl.* pink, four to five lines long, the standard pubescent, the other petals glabrous; racemes dense, many-flowered; peduncles curved, 4in. to 6in. long. July. *l.* shortly petiolate, very spreading or recurved; leaflets five to nine pairs, narrow, cuneate-oblong, ⅜in. long, recurved-pointed. South Africa, 1787. An erect or ascending, greenhouse sub-shrub.

T. purpurea (purple). *fl.* pale red, ¼in. to ⅜in. long, silky; racemes copious, elongated, all leaf-opposed, 3in. to 6in. long, loose, the lower flowers fascicled. July. *l.* shortly petiolate, 3in. to 6in. long; leaflets thirteen to twenty-one, narrow-oblanceolate, obtuse, glabrescent above, obtusely silky beneath. *h.* 1ft. to 2ft. Throughout the tropics, 1768. Stove perennial.

T. suberosa (slightly bitten). *fl.* pink; vexillum with a very short, callous claw, broadly oval; peduncles terminal and axillary, racemose, shorter than the leaves. July. *l.* shortly petiolate, 4in. to 6in. long; leaflets 1in. to 1½in. long, oblong-lanceolate or lanceolate, very pale, silky-canescent. *h.* 4ft. South Africa, 1818. Greenhouse shrub.

T. virginiana (Virginian).* *fl.* yellowish-white, marked with purple, large and numerous, clustered in a terminal, oblong, dense raceme or panicle. June and July. *l.*, leaflets seventeen to twenty-nine, linear-oblong. Stem erect and simple, 1ft. to 2ft. high, leafy to the top. North America, 1765. Half-hardy perennial.

TERAMNUS (from *teramnos*, soft; in reference to the pods and leaves). SYN. *Glycine* (of Wight and Arnott). ORD. *Leguminosæ.* A small, tropical genus of slender, twining, stove herbs. Flowers small, fascicled or racemose; standard ovate, narrowed at base, exappendiculate. Leaves pinnately trifoliolate, stipellate. Two species have been introduced, but they are not very ornamental, and are probably no longer in cultivation.

TERATOPHYLLUM. Included under *Acrostichum.*

TEREBINTH-TREE. A common name for **Pistacia Terebinthus** (which *see*).

TEREBINTHUS. A synonym of **Pistacia** (which *see*).

TEREDO. Any disease in plant life caused by the boring of insects.

TERETE. Free from angles; cylindrical or nearly so; tapering.

TERGEMINATE. "When each of two secondary petioles bears towards its summit one pair of leaflets, and the common petiole bears a third pair at the origin of the two secondary petioles; as in *Mimosa tergemina*" (Lindley).

TERMINAL. Proceeding from the end.

TERMINALIA (from *terminus*, end; alluding to the disposition of the leaves). Myrobalan-tree. Including *Badamia, Buceras, Bucida, Catappa, Fatræa, Myrobalanus,* and *Pentaptera.* ORD. *Combretaceæ.* A large genus (eighty to ninety species) of stove, evergreen, erect shrubs or trees, broadly spread over the tropics. Flowers green or white, rarely coloured, small, sessile, in spikes or heads; calyx five-toothed or five-cleft; petals wanting; stamens ten, biseriate. Leaves alternate, rarely nearly or quite opposite, often clustered at the tips of the branches, often stalked and entire. A few of the introduced species are here described. The bark of *T. Buceras* is greatly esteemed by tanners. Loam and peat form the most suitable compost for these plants. Propagation may be effected by cuttings, inserted in sand, and plunged in heat, under a glass. With the exception of *T. sericea*, all the species here described are trees.

T. angustifolia (narrow-leaved). A synonym of *T. Benzoin.*

T. Arjuna (Arjuna). *fl.*, spikes usually panicled. *l.* sub-opposite, oblong or elliptic, usually 4in. to 6in., sometimes 10in., long, suddenly narrowed at base, often cordate, obtuse or very shortly acute at apex, nearly glabrous beneath when old; petioles rarely more than ½in. long, with two glands near the apex. *h.* 60ft. to 80ft. India. (B. F. S. 28.) SYN. *Pentaptera Arjuna.*

T. Benzoin (Benzoin). *fl.*, racemes axillary, pedunculate, as long as the leaves. *l.* crowded at the thickened tips of the branches; oblong-lanceolate, crenate, obtuse or cuspidate, glabrous, subcoriaceous, 3in. to 4in. long, narrowed into glandular petioles. *h.* 30ft. to 40ft. Mauritius, 1824. A milky juice is said to flow from this tree, which, when dried, is used as incense in Mauritius. SYNS. *T. angustifolia, T. mauritiana.*

T. Buceras (Buceras). *fl.* rather distant; spikes cylindrical, silky or villous-pubescent. *l.* variable, obovate or spathulate-lanceolate, glabrous above, silky and glabrate beneath. *h.* 20ft. to 30ft. West Indies, 1793. A monstrosity of the flowers, transformed into long, cylindrical, arcuate bodies, is peculiar to this species. SYN. *Bucida Buceras* (B. R. 907).

T. Catappa (Catappa). Olive Bark-tree; Malabar Almond-tree. *fl.* in short-peduncled, slender, spike-like, axillary racemes. *l.* crowded near the ends of the branchlets, shortly petiolate, obovate, obtuse, entire, membranous, 6in. to 12in. long, glabrous or pilose beneath, with two glands near the base of the midrib. *h.* 60ft. to 80ft. Tropical Asia, &c., 1778. (B. M. 3004.)

T. Chebula (Chebula). Negroes' Olive-tree. *fl.*, spikes terminal, often panicled. *l.* not clustered, often sub-opposite, ovate or elliptic, usually acute and rounded at base, 4in. to 5in. long, more or less hairy when young; petioles about 1in. long, often with two glands near the summit. *h.* 80ft. to 100ft. India, 1796. (B. F. F. 29; B. F. S. 27.)

T. latifolia (broad-leaved). *fl.*, spikes simple, pedunculate, cylindrical. *l.* approximate at the tips of the branches, obovate-oblong, 6in. to 12in. long, glabrate or pubescent beneath, tapering into petioles 1in. long, often with small glands or tufts of hair in the vein-axils beneath. *h.* 80ft. to over 100ft. West Indies, &c., 1800.

T. mauritiana (Mauritian). A synonym of *T. Benzoin.*

T. sericea (silky). *fl.*, spikes silky, pedunculate, shorter than the leaves. *l.* alternate, crowded at the tips of the branches, oblong or obovate-oblong, 2½in. to 3in. long, mucronulate, quite entire, clothed with silky, appressed hairs on both surfaces, narrowed into short petioles. *h.* 6ft. and upwards. South Africa, 1816. Shrub.

TERMINALIS. A synonym of *Dracæna.*

TERNATE. A whorl of three; three things in opposition round a common axis; *e.g.*, a leaf consisting of three leaflets.

TERNATEA. Included under *Clitoria.*

TERNATELY-DECOMPOUND. Compound in a ternate manner.

TERNATELY-VERTICILLATE. Having three leaves in a whorl.

TERNSTRŒMIA (named after Christopher Ternstrœm, a Swedish naturalist and traveller in China, who

Ternstrœmia—*continued.*

died in 1745). SYN. *Taonabo*. Including *Reinwardtia* (of Korthals). ORD. *Ternstrœmiaceæ*. A genus comprising about twenty-five species of stove, evergreen trees or shrubs, of which five or six are found in the warmer parts of Asia and the Indian Archipelago, and the rest in tropical America. Sepals five, closely imbricated; petals five, imbricated, connate at base; stamens indefinite, adnate to the base of the corolla; peduncles one-flowered, recurved, axillary or lateral, solitary or sub-fasciculate, bibracteolate. Leaves coriaceous, entire or crenate-serrate. A selection of the few introduced species is given below. All are shrubs. They thrive in well-drained, fibrous loam, and are readily propagated by cuttings of the half-ripened young shoots, inserted under a bell glass, in bottom heat.

FIG. 15. FLOWERING BRANCH OF TERNSTRŒMIA ELLIPTICA.

T. elliptica (elliptic-leaved). *fl.* white; sepals rounded; peduncles drooping. July. *l.* variable, spathulate or elliptic, 3in. long, rather blunt, quite entire, obsoletely veined. *h.* 6ft. West Indies, 1818. See Fig. 15. SYN. *T. pedunculariis*.

T. pedunculariis (pedunculate-flowered). A synonym of *T. elliptica*.

T. sylvatica (sylvan). *fl.* white; petals not lined; anthers apiculate; bracts ovate, acute, under the calyx. July. *l.* lanceolate, obtusely acuminate. Branches smooth. *h.* 2ft. Mexico, 1840.

T. venosa (veined). *fl.* white; pedicels aggregate, axillary, a little shorter than the petioles. June to August. *l.* oblong, serrulated, veined. *h.* 6ft. Brazil, 1824.

TERNSTRŒMIACEÆ. A natural order of trees and shrubs, rarely climbing, mostly inhabiting tropical America and Eastern Asia. Flowers regular, hermaphrodite or rarely diclinous, showy or mediocre, rarely small; petals five, rarely four, six, or seven, free or shortly coalescing at base, the inner ones often larger; petals five, rarely four or six to nine, hypogynous, free or often coalescing at base in a ring or short tube, imbricated or twisted; stamens usually numerous; anthers basifixed and erect, or versatile, two-celled; disk none; ovary free; peduncles axillary, one or many-flowered, or the flowers in terminal, axillary racemes, rarely disposed in elongated panicles; bracteoles under the calyx often two. Fruit sometimes fleshy, coriaceous, or slightly woody and in-

Ternstrœmiaceæ—*continued.*

dehiscent, or a loculicidal or septicidal, dehiscent capsule. Leaves alternate or very rarely opposite, simple and undivided, or rarely digitately three to five-foliolate, entire or often serrated, coriaceous or rarely membranous, penninerved; stipules wanting or very rarely minute and highly caducous. The most important economical product of this family is Tea, *Camellia theifera* (= *Thea chinensis*). Although two centuries have not passed since Tea was first used in Europe, the annual importation now exceeds twenty-two millions of pounds. The order comprises about thirty-three genera and 260 species. Examples: *Camellia, Caryocar, Freziera, Ternstrœmia.*

TERPNANTHUS. A synonym of **Spiranthera** (which *see*).

TERRACE. A raised space of ground, sometimes formed round a mansion, or on the side of sloping ground, usually for the purpose of making a level walk. In some cases, it is necessary to have some arrangement of this sort; but, in many other instances, after having been made at great cost, Terraces have been found most objectionable, because of the walls interfering with views of landscape from the mansion, and also preventing the latter from being seen to advantage when approaching it. A Terrace retained in position by a strongly-built wall, on which flower-vases, &c., are fixed, is more likely to constitute a double block of this sort than when a sloping grass bank is substituted; if the latter can be arranged, it is, therefore, to be preferred when the formation of a Terrace is really necessary. A Terrace-walk may sometimes be introduced with advantage on rising ground, where an exceptionally good view is at command, that cannot, perhaps, be seen from elsewhere; but the formation of Terraces as architectural features, apart from the necessity of having them, often assists, if it does not entirely succeed, in destroying beautiful landscape. The advantages and disadvantages should, therefore, receive full consideration.

TESSARIA (named after Luis Tessari, Professor of Botany, &c., at Ancona, writer of works on "Materia Medica"). SYNS. *Gynheteria*, of Willdenow (*Gyneteria* of Sprengel), *Phalacromesus, Polypappus.* ORD. *Compositæ.* A small genus (five species) of hardy, Western American shrubs. Flower-heads small, cymose, sometimes disposed in an ample corymb; involucral bracts many-seriate; ray florets purplish, pale on the outside. Leaves alternate, entire or toothed. Probably none of the species are now cultivated in this country.

TESSELLATED. Chequered; when colours are disposed in small squares.

TESTA. The skin or integument of a seed.

TESTACELLA (a diminutive of *testa*, a shell; in allusion to the small size of the shell). A genus of Slugs which must be regarded as beneficial in gardens, inasmuch as they feed exclusively on earthworms, following them into their burrows. The body is long and

Testacella—*continued.*

slender, so as to pass easily along the burrows. On the hinder part of the back is a small, depressed, ear-shaped shell, about ¼in. long, which protects the rear of the animal when in the burrows. This external shell at once distinguishes these animals from the true Slugs, which do mischief in gardens. Two species are known in England.

T. haliotidea is dirty-yellow, with brown specks, rarely pale yellow, sometimes entirely black; when extended, it is about three inches long. It is said to swallow the worms alive. This species is known to occur in many localities in the South of England, and has been found as far north as Kirkcaldy, in Fifeshire.

T. Maugei is a native of South-west Europe, but has naturalised itself near Bristol. It is dark brown, and the shell is larger than in *T. haliotidea.*

TESTACEOUS. Brownish-yellow; resembling unglazed earthenware in colour.

FIG. 16. TESTUDINARIA ELEPHANTIPES.

TESTUDINARIA (from *testudo*, a tortoise; alluding to a supposed resemblance in the outside roots). ORD. *Dioscoreaceæ.* A small genus (two species) of greenhouse twiners, endemic in South Africa. Flowers dicœcious,

Testudinaria—*continued.*

small, racemose in the axils, resembling those of *Dioscorea.* Leaves alternate, caudate or sub-deltoid. *T. elephantipes*, the species best known to cultivators, is an interesting plant, succeeding well in thoroughly-drained, sandy loam. During the period of rest, it should be kept dry. Increased by imported roots.

T. elephantipes.* Elephant's Foot; Hottentot Bread; Tortoise-plant. *fl.* greenish-yellow, sometimes dark-spotted, rather long-pedicellate; male racemes axillary, solitary, 1¼in. to 1⅝in. long, simple, sometimes simply branched below; females axillary, solitary, pedunculate, few-flowered, scarcely 1in. long. July. *l.* broadly cordate-ovate, sub-reniform, with a stout mucro, seven to nine-nerved, complicated. *h.* 10ft. 1774. See Fig. 16. (B. R. 921; B. M. 1347, under name of *Tamus elephantipes.*)

TETA. A synonym of **Peliosanthes** (which *see*).

TETRA. This term, used in Greek compounds, signifies four: *e.g.*, Tetrapyrenus, four-stoned.

TETRACARPUM. A synonym of **Schkuhria** (which *see*).

TETRACERA (from *tetras*, four-fold, and *keras*, a horn; alluding to the curved shape of the four capsules). SYNS. *Euryandra, Wahlbomia.* ORD. *Dilleniaceæ.* A genus including about two dozen species of glabrous or scabrous-pubescent, stove, climbing shrubs or rarely trees, dispersed over tropical regions. Flowers paniculate; sepals four to six, spreading; petals equalling the sepals in number, or rarely fewer; carpels three to five (rarely one or two?). Leaves parallel-penniveined. The few species introduced, having no recommendation beyond their botanical features, are probably lost to cultivation.

TETRACHOTOMOUS. When a stem ramifies in fours.

TETRADENIA (of Nees). Included under **Litsea** (which *see*).

TETRADIUM (from *tetradeion*, a quaternion; the parts of flowers and fruit are in fours). ORD. *Rutaceæ.* A monotypic genus, now included, by Bentham and Hooker, under *Evodia.* The species is a stove, evergreen tree, requiring culture similar to **Brucea** (which *see*).

T. trichotomum (trichotomous-racemed). *fl.* whitish, disposed in large, sub-terminal, trichotomous panicles; calyx short, four-parted; petals four, longer than the calyx; stamens four. April and May. *l.* smooth, imparipinnate; leaflets quite entire. *h.* 20ft. Cochin China, 1822. The proper name of this species is *Evodia fraxinifolia.*

TETRADYNAMIA. A Linnean class, characterised by the flowers being tetradynamous.

TETRADYNAMOUS. "Having six stamens, of which two are longer than the four others, which stand in pairs on opposite sides of an ovary; as in Crucifers" (Lindley).

TETRAGASTRIS. A synonym of **Hedwigia** (which *see*).

TETRAGONAL. Four-angled.

TETRAGONIA (from *tetra*, four, and *gonia*, an angle; alluding to the fruit). SYN. *Demidovia.* ORD. *Ficoideæ.* A genus comprising about a score species of greenhouse or hardy, prostrate or somewhat climbing herbs or sub-shrubs, mostly South African, a few being also found on the shores of Eastern Asia, Australia, and temperate South America. Flowers green, yellowish, or reddish, axillary, solitary or few, sessile or on long pedicels, sometimes sub-spicate; calyx lobes three to five; petals none. Leaves alternate, oblong, linear, ovate, or deltoid, entire, rather thick; stipules absent. *T. expansa*, the only species calling for description here, is grown in gardens as a substitute for summer Spinach. For culture, &c., *see* **New Zealand Spinach.**

T. expansa (expanded). New Zealand Ice Plant; New Zealand Spinach. *fl.* yellow, small, on very short pedicels or almost sessile in the axils, solitary or twin. *l.* petiolate, the larger ones

Tetragonia—*continued.*

FIG. 17. BRANCHLET OF TETRAGONIA EXPANSA.

ovate, triangular, or broadly hastate, 2in. to 4in. long, entire, obtuse or acute, the smaller ones narrower. Australia, New Zealand, &c. Plant hardy, decumbent or prostrate, often extending to several feet. See Fig. 17. (B. M. 2362.)

TETRAGONIACEÆ. Included under *Ficoideæ*.

TETRAGONOLOBUS. Included under **Lotus** (which *see*).

TETRAGONOTHECA (from *tetragonos*, quadrangular, and *theke*, a case; alluding to the four-angled grains). ORD. *Compositæ*. A small, North American genus (three species) of tall, erect, hardy, perennial herbs. Flower-heads yellow, rather large, solitary or loosely corymbose, heterogamous; ray florets ligulate, spreading; involucre explanate, with four bracts in one series; achenes thick, triangular, glabrous or slightly pilose. Leaves opposite, amplexicaul, deeply toothed or incised-pinnatifid. Only one species has been introduced. It is an interesting plant, thriving in any light, rich soil. Propagation may be effected by divisions, or by seeds.

T. helianthoides (Sunflower-like). *fl.-heads* pale yellow, large, pedunculate, terminating the branches; involucre 2in. or more in diameter. August. *l.* 3in. to 6in. long, repandly and unequally toothed, or with coarse, sharp, salient teeth. Stem 2ft. to 3ft. high, terete. 1726.

TETRAHIT. A synonym of **Galeopsis** (which *see*).

TETRAHITUM. A synonym of **Stachys** (which *see*).

TETRAMERIUM. A synonym of **Faramea** (which *see*).

TETRAMICRA (from *tetra*, four, and *micros*, small; in allusion to the four smaller divisions of the anther). Including *Leptotes*. ORD. *Orchideæ*. A genus including about half-a-dozen species of stove, terrestrial or epiphytal orchids, natives of tropical America, from Brazil to the West Indies. Flowers mediocre, pedicellate; sepals and petals sub-equal, free, spreading; lip affixed to the base of the column, free, spreading, the lateral lobes shortly clawed, the middle one broad, entire; column erect, broadly two-winged above or from the base; raceme simple, loose; peduncle terminal, elongated, slender, rigid. Leaves linear, fleshy, semi-terete or

Tetramicra—*continued.*

very short and thick. Stems leafy, scarcely thickened, not pseudo-bulbous. The best-known species are here described. They thrive under conditions which suit *Sophronitis*. They may be grown on blocks of Tree-fern stem with a little sphagnum round the collar of the plant, or in baskets of fibrous peat, sphagnum, potsherds, and a few pieces of charcoal, intermixed. Cool treatment best suits the species described below, and all like a light place; they do well when suspended near the roof of the cool Orchid house. They are propagated by division.

T. bicolor (two-coloured). *fl.* solitary; sepals and petals white linear-oblong; lip having two very short lateral lobes, and an oblong front lobe nearly as long as the petals, white, streaked with purple on the disk; ovary very long, pedunculiform. Winter. *l.* solitary, terminating the stems, terete, recurved, fleshy, grooved above. Rhizome creeping, throwing up several slender stems about 1in. long, almost cylindrical. Brazil, 1831. SYN. *Leptotes bicolor* (B. R. 1625), *L. b.* var. (B. M. 3734).

T. rigida (rigid). *fl.*, sepals and petals greenish; lip rosy, purple-striped, exserted, the lateral segments spreading, the middle one roundish-obovate, large; scape distantly sheathed, few-branched above or simple. March. *l.* few, 4in. to 8in. long, half-cylindrical, linear, channelled, acuminate, recurved. *h.* 1ft. to 2ft. West Indies. Plant rigid. SYN. *Brassavola elegans* (B. M. 3098).

T. serrulata (serrulated). *fl.* as in *T. bicolor*, but three or four times larger; lip white, with lines of brilliant lake radiating from the base, where it has two short, rounded auricles; scapes terminal, axillary, purple. April and May. *l.* cylindrical, fusiform, grooved, glaucous-green, dotted with purple. Stems sometimes two-leaved. Brazil. SYN. *Leptotes serrulata* (L. S. O. 11).

TETRANEMA (from *tetra*, four, and *nema*, a filament; the genus is characterised by having four stamens). ORD. *Scrophularineæ*. A monotypic genus. The species is a pretty, dwarf, perennial, greenhouse herb. In spring, it should be potted in a compost of leaf mould and sandy loam, and placed in the greenhouse, where it will bear a profusion of flowers during the greater part of the summer. The atmosphere of a warm greenhouse is necessary during winter. Propagation may be effected by seeds, or by divisions.

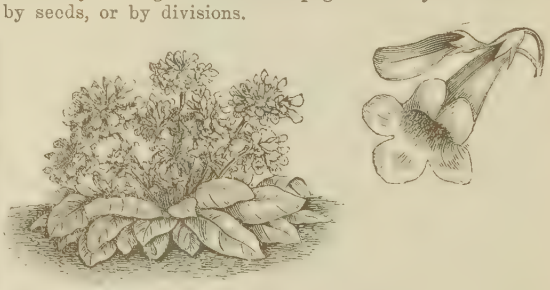

FIG. 18. TETRANEMA MEXICANA, showing Habit and detached Flower.

T. mexicana (Mexican). Mexican Foxglove. *fl.* shortly pedicellate, on axillary, scape-like peduncles; calyx five-parted; corolla purplish-violet, variegated with a paler colour; stamens four. *l.* sub-radical, opposite, obovate or oblong, loosely crenate-toothed, angled at base, glabrous. Stems very short, or in cultivation slightly elongated and ascending. Mexico, 1843. See Fig. 18. (B. H. 1879, 16; B. M. 4070; B. R. xxix. 52.)

TETRANTHERA. A synonym of **Litsea** (which *see*).

TETRANTHUS (from *tetra*, four, and *anthos*, a flower; in allusion to the four flowers—two male and two female—in each head). ORD. *Compositæ*. A small genus (two species) of dwarf, creeping, stove herbs, confined to Domingo. Flower-heads whitish, very small, on solitary, filiform peduncles. Leaves opposite, petiolate, ovate. *T. littoralis*, the only species introduced, is probably now lost to cultivation.

TETRANYCHIDÆ. A family of Mites, which feed on living plants, on the leaves of which webs are spun by them. The commonest and most hurtful species is *Tetranychus telarius*, commonly known as the "Red Spider."

TETRANYCHUS TELARIUS, or RED SPIDER. This is not a Spider, but a true Mite. It is frequently most injurious to cultivated plants, and is peculiarly hurtful to certain fruit-trees (*e.g.*, Plum), to Hollyhocks, and to many of the more delicate greenhouse plants. A good deal of doubt exists as to whether there is only one species of Red Spider, liable to variation in colour, and in other minor points, or whether there are several closely-related species. It matters little to gardeners whether there are more than one or no, since the habits, harm done by them, and remedies against them, are the same for all, and will be discussed here as if there were but one. The creatures are too small to be seen with the unaided eye, save as minute, moving specks on the leaves; but often their numbers render the effects produced by them conspicuous. Their colour is usually some shade between rust-red and brick-red, but some (probably immature) are greenish, with brown specks on the sides. The body is oval, without any separation between the thorax and abdomen (unlike the structure in Spiders). There are four pairs of nearly equal legs, of which two pairs are turned forwards and two backwards. On the upper part of the body, near the front, are two minute eyes, and a beak or sucker, for boring into, and sucking juices from, the leaves of plants. Near the hinder end of the body, on the lower surface, is a conical wart, which is an organ used for spinning threads.

The name Spider has probably been given to these mites because of their powers of spinning. The females lay eggs; from these emerge larvæ, which differ from the adults in their size, and in having only six legs. The mites, when they establish themselves upon plants, spin webs of very fine texture on the backs of the leaves. They then, by means of their suckers, bore into the leaf-cells and suck out the sap. The leaves become yellowish or greyish-green, marbled with paler patches on the upper surface; the glistening web covering the lower surface renders it grey. A severe attack by Red Spider kills the leaves, which fall prematurely; the fruit crop is lessened; and the young branches formed the next year are stunted and weakened.

Prevention. Attacks of Red Spider are worst when the growth of plants is checked by drought and heat; hence, any measures that promote growth—such as frequent syringing—diminish the risk to some extent. Plants that show symptoms of being attacked, should be at once separated from the rest, and specially treated. Free access of air is much to be recommended. Soot, caustic lime, sand impregnated with spirits of tar, or other similar substances, may be laid round the bases of the stems of the plants to be protected, to prevent the mites from getting access to them. Poles and other supports should have their surfaces planed quite smooth, to prevent the mites from harbouring in crevices, and to allow of being thoroughly washed.

Remedies. Sulphur, in the form of Flowers of Sulphur, is almost a certain cure for Red Spider, and for some Fungi. It is sometimes dusted dry on the leaves, but is better employed in solution, *e.g.*, 1lb. of sulphur, boiled with 2lb. of quicklime in four gallons of water; or the sulphuret of lime may be employed, in the proportion of 4oz. of sulphuret to 2oz. of soft soap and one gallon of boiling water. The sulphuret and the soap should be thoroughly mixed, and must be well stirred while the water is being poured on them. The plants may be dipped into the mixture; and it may be applied to the bark with a stiff brush. Various other washes have been found useful; *e.g.*, Gishurst Compound, Veitch's Chelsea Blight Composition, and solutions prepared from quassia-wood. Fumigation with tobacco-smoke, or with sulphur and chalk, mixed in water and painted on the hot-water pipes, is also recommended. To cleanse infested walls, the following method may be employed with success: Add clay to a solution of soot

Tetranychus telarius—*continued.*

in water till the mixture is of the consistency of thick paint; then add 1lb. of flowers of sulphur, and 2oz. of soft soap, to each gallon; well mix the whole, and carefully paint the entire surface of the walls with the preparation.

TETRAPASMA. A synonym of **Discaria** (which *see*).

TETRAPELTIS. A synonym of **Otochilus** (which *see*).

TETRAPOGON (from *tetra*, four, and *pogon*, a beard; in reference to the bearded flowers). ORD. *Gramineæ*. A genus consisting of four species of hardy, tufted, often stoloniferous grasses, natives of North Africa, Abyssinia, and Western Asia. Spikelets two or three-flowered, clustered, secund, or nearly distichous; spikes one, two, or three at the apices of the peduncles; glumes two, the lower one empty; stamens three. Leaves flat. *T. villosus*, the only species introduced, is of no horticultural value.

TETRAPTERYS (from *tetra*, four, and *pteron*, a wing; the samaras are four-winged). ORD. *Malpighiaceæ*. A genus comprising about fifty-two species of usually climbing, stove shrubs, natives of tropical America, mostly Brazilian. Flowers yellow or reddish; calyx five-parted, with eight glands, rarely ten or none; petals clawed; stamens ten, all perfect, the alternate ones longer; umbels or racemes often panicled, terminal, rarely sub-sessile. Leaves opposite, entire, often transparent, not glandular; stipules two, variable. The species are rather ornamental, but extremely difficult to bring into flower in this country, and it is doubtful whether those described below are still in cultivation. A compost of peat and sand forms the most desirable soil for them. Ripened cuttings will root in sand, under a hand glass, in heat.

T. citrifolia (Citrus-leaved). A synonym of *T. inæqualis*.

T. discolor (discoloured). *fl.* yellow; pedicels hoary-pubescent, articulated at the middle; umbels four-flowered, paniculate. May. *l.* elliptic or elliptic-oblong, bluntish or slightly acute, coriaceous, glabrous; stipules interpetiolar, deciduous. Guiana and Trinidad, 1827.

T. inæqualis (unequal). *fl.* yellow; petals articulated at or below the middle; umbels four-flowered, paniculate. May. *l.* ovate or elliptic, acute, coriaceous; stipules interpetiolar, deciduous. Brazil and Jamaica, 1818. SYN. *T. citrifolia*.

TETRAQUETROUS. Having four very sharp and almost winged corners or angles.

TETRASTICHOUS. Having a four-cornered spike.

TETRATHECA (from *tetra*, four, and *theke*, a cell; the anthers are sometimes four-celled). ORD. *Tremandreæ*. A genus embracing eighteen species of small, very pretty, glabrous or glandular-hairy, greenhouse, Australian shrubs. Flowers four or five-parted, rarely three-parted, possessing the peculiarity of only opening during bright sun and on fine days, but closing on the approach of evening, or when rain is imminent; stamens sub-biseriate. Leaves alternate, whorled, or scattered, Heath-like and entire or flat and toothed, or reduced to minute scales. A selection of the introduced species is here presented. They are rather difficult to cultivate. A compost of fibry peat, with plenty of silver sand intermixed, is most suitable. Water must be very carefully administered at all times, and only soft rain-water should be used. Propagation may be effected by cuttings of the young wood, inserted in sand, under a bell glass, and kept well shaded.

T. ciliata (hair-fringed). *fl.* pink; sepals bearing a few glandular hairs or bristles; petals about ¼in. long. July. *l.* almost all whorled in threes or fours, broadly ovate or nearly orbicular, obtuse or slightly acute, rarely exceeding ¼in. in length, the margins flat or scarcely recurved, ciliated or nearly glabrous. Stems slender, erect, or diffuse, 1ft. to 3ft. long.

Tetratheca—*continued.*

T. ericifolia (Heath-leaved). *fl.* pink, on slender pedicels usually longer than the leaves; sepals not reflexed. July. *l.* mostly whorled, narrow-linear with the margins closely revolute, or rarely oblong-lanceolate and more open, mostly under ½in. in length. *h.* 1ft. or less. 1820. Plant diffuse. (S. E. B. i. 20.)

T. ericoides (Heath-like). A synonym of *T. pilosa.*

T. glandulosa (glandular). A synonym of *T. pilosa denticulata.*

T. hirsuta (hairy).* *fl.* pink, rather large, on slender pedicels ⅔in. to 1in. long; sepals lanceolate; petals oblong. March. *l.* mostly alternate, a few whorled, ovate-lanceolate to oblong-linear, obtuse, ⅓in. to 1in. long, the margins recurved, more or less hirsute above, villous or pubescent beneath. Stems rigid and erect, 6in. to 18in. high, often hispid with reddish hairs. 1843. (B. R. 1844, 67; P. M. B. xiii., p. 53.)

T. juncea (Rush-like). *fl.* purple; sepals four, small, ovate, obtuse; petals four, about ⅓in. long; pedicels in the upper axils. July. *l.* few, small and distant, scale-like, rarely ½in. long. Stems erect or ascending, slender, Rush-like or wiry, 1ft. to 2ft. long, with two or three acute angles or very narrow wings. 1803.

T. nuda (naked). *fl.* crimson, on slender pedicels; sepals and petals five each. May. *l.* very minute and distant, or a very few linear or oblong ones two or three lines long. Rhizome woody, with numerous erect, slender, rigid, but Rush-like stems, 9in. to 18in. high, often ending in an almost pungent point. 1843.

T. pilosa (pilose).* *fl.* purple, rather small, on pedicels usually shorter than the leaves; petals narrow. July. *l.* usually linear, with the margins much revolute, four to six lines long, but in very luxuriant shoots sometimes broadly lanceolate or oblong, with an obtuse base. *h.* 1ft. to 1½ft. 1823. Plant Heath-like. (F. d. S. 1065, under name of *T. ericoides.*)

T. p. denticulata (denticulate-leaved). *fl.*, calyx and pedicels slightly glandular-hairy. *l.* narrow, revolute, occasionally opposite. 1822. (S. E. B. i. 21, under name of *T. glandulosa.*)

T. thymifolia (Thyme-leaved). *fl.* purple; sepals ovate-lanceolate, seldom reflexed. July. *l.* almost all whorled in threes or fours, ovate-elliptic or lanceolate, the margins more or less recurved or revolute. *h.* 1ft. to 3ft. 1824. Plant very pubescent or hirsute. (S. E. B. i. 22.)

T. verticillata (whorled). A synonym of *Platytheca galioides.*

TETRAZYGIA (from *tetra*, four, and *zugos*, a yoke; alluding to the fourfold arrangement of the parts of the flower). ORD. *Melastomaceæ.* A genus comprising about thirteen species of stove, usually furfuraceous shrubs or trees, inhabiting the West Indies. Calyx tube urceolate or globose, constricted above the ovary, the limb four or five-lobed; petals four or five, obovate, obtuse; stamens eight or ten, equal, the filaments subulate; panicles or corymbs terminal, many-flowered. Leaves petiolate, oblong, ovate, or ovate-lanceolate, entire or denticulated, three to five-nerved. The species here described are well worth cultivating. They require similar treatment to that recommended for **Melastoma.**

T. angustiflora (narrow-flowered). *fl.* white, large, but with a narrow calyx; petals five, rarely four, four to five lines long; panicles racemiform, oblong, the primary branches terminated by corymbiform cymes. May. *l.* elliptic or elliptic-lanceolate, abruptly acuminate, 3in. to 5in. long, entire, whitish-downy beneath. Branchlets (and inflorescence) powdery-downy. *h.* 20ft. 1823. Tree. (B. M. 4383, under name of *T. elæagnoides.*)

T. discolor (two-coloured). *fl.* white, small, densely crowded in a corymbiform panicle; petals oval. May. *l.* ovate or ovate-lanceolate, entire, sharp-pointed, 3in. to 5in. long, white beneath with adpressed, scaly down. *h.* 3ft. 1793. A low shrub.

T. elæagnoides (Oleaster-like). *fl.* pink or white, disposed in a corymbiform, or sometimes racemiform, panicle; petals four, three to four lines long. June. *l.* elliptic-lanceolate or lanceolate, sharply acuminate, narrower than those of *T. angustiflora*, whitened beneath by tomentose down. *h.* 2ft. or more. 1848. Shrub.

TEUCRIUM (the old Greek name used by Dioscorides, probably from Teucer, King of Troy, who is said to have first used the plant medicinally). Germander. Including *Polium*, *Scordium*, and *Scorodonia.* ORD. *Labiatæ.* A large genus (nearly 100 species) of greenhouse or hardy herbs, sub-shrubs, or shrubs, of variable habit, dispersed over the temperate and warmer regions of the globe. Calyx tubular or campanulate, rarely inflated, five-toothed; corolla limb quasi-bilabiate, obliquely five-lobed, the two upper lobes very small, the two lateral larger, the lowest largest; stamens four; whorls two or rarely many-flowered, axillary, or disposed in spikes, racemes, or heads. Nutlets obovoid, reticulate-wrinkled. Leaves

Teucrium—*continued.*

entire, toothed, or incised, sometimes multifid; floral ones conformed or reduced to bracts. *T. Botrys*, *T. Scordium* (Water Germander), and *T. Scorodonia* (Wood Sage), are British plants. *T. Chamædrys*, an escape from gardens, has become naturalised. *T. Pseudo-Scorodonia* (Bastard Wood Sage), an inconspicuous species nearly allied to the British *T. Scorodonia*, is now and then met with in gardens. Few of the species have any horticultural merit, but several are of medicinal value. All thrive in any moderately good soil. The shrubs may be increased by cuttings, inserted in sandy soil, under a glass, in spring or summer; the perennials by divisions.

T. betonicum (Betony-like). *fl.* purplish; corolla tube exserted, pubescent outside, the throat inflated and incurved; whorls two-flowered, secund, loosely racemose; racemes 3in. to 6in. long. May to August. *l.* ovate-oblong, 1in. to 1½in. long, on rather long petioles, crenate, woolly below or on both sides; floral ones shorter than the calyx. Branches cano-tomentose. *h.* 1½ft. Madeira, 1775. Greenhouse, evergreen shrub. (B. M. 1114.)

T. bicolor (two-coloured). *fl.* blue; peduncles short, axillary, one-flowered, the upper ones sub-racemose. July. *l.* ovate, oblong, or lanceolate, nearly 1in. long, entire or cut, sometimes trifid; young ones often linear, entire or trifid; floral ones usually exceeding the flowers. Branches 1ft. to 2ft. long, acutely tetragonal. *h.* 1ft. Chili, 1826. Greenhouse, glabrous perennial. SYN. *T. orchideum* (B. R. 1255).

FIG. 19. FLOWERING STEM OF TEUCRIUM CHAMÆDRYS.

T. Chamædrys (Chamædrys).* Wild Germander. *fl.* rosy, ⅔in long, the lower lip spotted with white and red; whorls about six-flowered, in the axils of leafy bracts, or sub-secund in leafy, terminal spikes. July to September. *l.* petiolate, ovate, incised-crenate, ⅓in. to 1½in. long, gradually narrowed into the petioles. Stem 6in. to 18in. long, ascending, much branched. Rootstock creeping. Europe (naturalised in Britain). A hispidly-hairy perennial. See Fig. 19. (Sy. En. B. 1094.)

T. fruticans (shrubby).* Tree Germander. *fl.* blue, on one-flowered peduncles shorter than the tomentose calyx; racemes terminal or lateral on short branchlets, few-flowered. Summer. *l.* ovate, obtuse, entire, flat, very shortly petiolate, glabrous above, white or rufescent-tomentose beneath. Branches divaricate. *h.* 2ft. to 3ft. South Europe, 1869. Greenhouse or half-hardy, evergreen shrub. (Ref. B. 204; S. F. G. 527.) SYN. *T. latifolium* (B. M. 245).

T. hircanicum (Hyrcanian). *fl.* purple, on short, erect, villous pedicels; corolla villous outside; spikes simple, dense, 3in. to 8in. long. September. *l.* petiolate, ovate-cordate, 1in. to 3in. long, deeply crenate, obtuse, scarcely pubescent above, softly sub-canescent beneath. Stems 1ft. to 2ft. high, pubescent, scarcely branched. Persia, 1763. Hardy perennial. (B. M. 2013.)

T. latifolium (broad-leaved). A synonym of *T. fruticans.*

T. Marum (Marum). Cat Thyme. *fl.* reddish-purple, in pairs at the axils of the upper leaves, forming an oblong, generally rather crowded, nearly one-sided inflorescence; corolla with the median lobe sub-orbicular; calyx hairy, with shortly acuminate, lanceolate, nearly equal teeth. Summer. *l.* shortly stalked,

Teucrium—*continued.*

entire, oval or lanceolate, green, pubescent above, white-woolly beneath. Stems shrubby, erect. *h.* 1ft. Western Mediterranean region. Hardy. Cats have a strange liking for this plant.

T. orchideum (Orchid-like). A synonym of *T. bicolor.*

T. orientale (Eastern). *fl.* blue, disposed in a loose, sometimes hispid-pilose panicle; pedicels or peduncles one-flowered, nearly twice as long as the acutely-toothed calyx. July. *l.* once or twice pinnatisect, the lower ones 1½in. to 2in. long, broadly ovate in outline, the floral ones minute; segments linear, entire or incised. *h.* 1ft. Levant, 1725. A hardy, sometimes loosely pubescent or canescent, erect perennial. (B. M. 1279; L. B. C. 1871.)

TEYSMANNIA (so called in honour of J. E. Teysmann, a Dutch gardener, who published a "Catalogus Plantarum," in 1838). ORD. *Palmæ.* A monotypic genus. The species is a dwarf, unarmed, stove Palm, closely allied to *Corypha*, from which it differs mainly in habit. The natives of Sumatra use the leaves of this Palm for thatching their houses, a purpose for which, from their large size and entire form, they are admirably adapted. For culture, *see* **Corypha.**

T. altifrons (tall-leaved). *fl.*, spathes papery-coriaceous, sheathing the fuscous-tomentose peduncle and the spadix branches; spadix rather short, with deflexed branches. *fr.* as large as an apple, globose or depressed-globose, one-celled, one-seeded. *l.* erect, elongated-rhomboid, obtuse, acute at base, 6ft. to 7ft. long, 1½ft. wide, induplicately plicate, laciniated on the margins, the segments obtusely bifid; petioles carinate at back, obsoletely concave in front, the angles rounded, uncinate-prickly. Caudex subterraneous. Sumatra.

THALAMIA. A synonym of **Phyllocladus** (which *see*).

THALAMIFLOROUS. When the stamens arise immediately from the thalamus.

THALAMUS. The receptacle in a flower; the part on which the carpels are placed.

THALASIUM. A synonym of **Panicum** (which *see*).

THALIA (named in honour of J. Thalius, a German physician and botanist, who died in 1588). SYN. *Peronia.* ORD. *Scitamineæ.* A genus embracing about five species of stove, greenhouse, or hardy herbs, natives of tropical America, one species extending as far as the Southern United States, and one being found in tropical Africa. Flowers in pairs, pedicellate, loosely spicate; sepals three, free, equal, membranous, equalling or much shorter than the corolla; petals three, free or very shortly connate at base, equal or the dorsal one scarcely broader; androœcious tube short, the lobes petaloid, very irregular; panicle terminal; bracts spreading under the branchlets, deciduous. Leaves few, ample; floral ones sometimes conformed. *T. dealbata*, the only species that calls for description here, is an aquatic plant, sufficiently hardy to withstand the severity of our winters, provided it be planted about 2ft. beneath the surface of the water. It is a very elegant subject for aquaria. Propagation may be effected by division of the rootstock.

T. dealbata (whitened). *fl.* purple, small; valves of the spathe unequal, ovate, coriaceous; spikes erect; panicle erect, dense, smooth, the branches not longer than the lanceolate, deciduous bracts at their base; scape terete, Reed-like, 3ft. to 5ft. high. June to September. *l.* distichous, long-petiolate, cordate-ovate, acute, 6in. to 9in. long; petioles 1ft. to 2ft. long. South Carolina, &c., 1791. Plant dusted over with a minute, white powder; otherwise smooth. See Fig. 20. (B. M. 1690.)

T. sanguinea (blood-coloured). A synonym of *Stromanthe sanguinea.*

THALICTRUM (the old Greek name used by Dioscorides, probably derived from *thallo*, to grow green; alluding to the bright colour of the young sprouts). Meadow Rue. ORD. *Ranunculaceæ.* A genus embracing about thirty species of hardy herbs, with perennial stems, nearly all inhabiting North temperate and frigid regions. Flowers green, yellow, purple, or white, often polygamous, paniculate or rarely racemose, usually small with the anthers conspicuously exserted, or rarely larger with smaller anthers; involucre and petals wanting; sepals

Thalictrum—*continued.*

four or five, petaloid; achenes often compressed. Leaves ternately decompound; cauline ones, when present, alternate. Among the species, three of which are included in the British Flora, there are several well deserving of a place at the back of the flower border. A representative selection of the most desirable kinds is presented below. Any fairly good garden soil is suitable. The plants may be multiplied by divisions.

T. alpinum (alpine). *fl.* few; sepals four, purplish; raceme drooping, afterwards erect, simple. July and August. *l.* biternate; leaflets ¼in. to ½in. long, sub-orbicular, glaucous beneath, obtusely lobulate. Stem 4in. to 10in. long, often stoloniferous. Europe (Britain), Asia, and North America. (B. M. 2237; Sy. En. B. 2.)

T. anemonoides (Anemone-like).* Rue Anemone. *fl.* several in an umbel; sepals five to ten, white, rarely pinkish, oval, ½in. long. Early spring. *l.* bi- or triternately compound; leaflets roundish, cordate at base, long-petiolulate. Stem arising from a cluster of thickened, tuberous roots. *h.* 6in. North America, 1768. (I. H. 1829, 211; S. B. F. G. ser. ii. 150; B. M. 866 and L. B. C. 964, under name of *Anemone thalictroides.*)

T. a. flore-pleno (double-flowered). This only differs from the type in having double flowers. (F. d. S. 1155; L. B. C. 770.)

FIG. 20. THALIA DEALBATA.

Thalictrum—*continued.*

T. aquilegifolium (Columbine-leaved).* Feathered or Tufted Columbine. *fl.* disposed in a corymbose panicle; sepals white, fugacious; stamens usually purple, sometimes white. May to July. *l.* tripinnate; leaflets sub-orbicular, smooth, deeply toothed; stipules ovate, twin. Stem fistular, purple, mealy. *h.* 1ft. to 3ft. Europe and Asia, 1731. (B. M. 1818; J. F. A. 318.)

T. a. atropurpureum (dark purple).* Stamens and stems dark purple.

T. a. formosum (beautiful). Stamens dark purple, dilated at apex. (B. M. 2025.)

T. a. roseum (rosy). *fl.*, sepals rose-coloured. 1880.

FIG. 21. PANICLE OF THALICTRUM FLAVUM.

T. flavum (yellow). False Rhubarb; Fen Rue, &c. *fl.* often umbellate, erect, crowded; sepals pale yellow, small; anthers bright yellow; panicle compound, sub-corymbose or pyramidal. July and August. *l.* ternately bi- or tripinnate; leaflets 1in. to 1½in. long, three-lobed. Stem 2ft. to 4ft. high, stout. Rootstock yellow, creeping. Europe (Britain) and Asia. See Fig. 21. (Sy. En. B. 8.)

T. glaucum (glaucous). *fl.* crowded in an erect, compound panicle; sepals four or five, yellow. June and July. *l.*, leaflets ovate-orbicular, three-lobed; lobes deeply toothed. Stem erect, round, striated, mealy. *h.* 2ft. to 5ft. South Europe, 1798.

T. minus (lesser). *fl.* yellow, green, drooping, in lax panicles. Summer. *l.* triangular, three or four-pinnate; leaflets variable, acute or obtusely-lobed, often glaucous. Northern hemisphere (Britain). (Sy. En. B. 3.) Some of the forms of this species make desirable border or pot plants on account of their beautiful Maidenhair-like foliage.

T. petaloideum (petaloid-sepaled). *fl.* corymbose; sepals white, nearly round; filaments flesh-coloured; anthers yellow. June and July. *l.* ternately decompound; leaflets smooth, ovate, obtuse, entire or three-lobed. Stem round, almost naked. *h.* 1½ft. Dahuria, 1799. (L. B. C. 891.)

T. tuberosum (tuberous-rooted).* *fl.* loosely corymbose; sepals five, white, oval, blunt. June. *l.* crowded, petiolate, bi-tripinnate; leaflets orbicular, three-lobed, smooth. Root grumose. *h.* 1ft. Spain, 1713.

THALLUS. A fusion of leaves and stem into one general mass.

THAMNEA (from *thamnos*, a shrub; alluding to the nature of the plant). ORD. *Bruniaceæ*. A monotypic genus. The species is a pretty, little, greenhouse undershrub. It thrives in a compost of peat and sand. Propagation may be effected by cuttings, inserted in sand, under a glass.

Thamnea—*continued.*

T. uniflora (one-flowered). *fl.* white, small, terminal, solitary; calyx adnate with the ovary, five-lobed; petals five, with two-keeled claws and an ovate, spreading limb; stamens five, included. April. *l.* very small, somewhat rhomboidal, short, blunt-keeled, closely pressed, spirally inserted; upper ones rather longer, forming an involucre to the flower. Branches filiform, erect, fastigiate. *h.* 1ft. South Africa, 1810.

THAMNOCHORTUS (from *thamnos*, a shrub, and *chortos*, grass; alluding to the habit of the plants). Shrubby Grass. ORD. *Restiaceæ*. A genus comprising ten species of greenhouse, perennial herbs, confined to South Africa. Flowers dicœcious, arranged in spikelets. Flowering stems from a creeping or short and erect rhizome, Rush-like, undivided. *T. dichotomus* has been introduced, but it possesses no horticultural merit.

THAMNOPTERIS. Included under *Asplenium*.

THAPSIA (the old Greek name used by Theophrastus, so called from the Island of Thapsos). Deadly Carrot. Including *Melanoselinum* and *Monizia*. ORD. *Umbelliferæ*. A small genus (four species) of greenhouse or half-hardy, perennial (or biennial?), tall herbs, sometimes having a very elongated, shrubby stem, natives of the Mediterranean region and Madeira. Flowers yellowish, dirty-white, or purplish, in compound, many-rayed umbels; calyx teeth small; petals inflexed at apex, shortly acuminate; involucre often wanting. Leaflets pinnately decompound; segments incised-pinnatifid. *T. garganica* has long been celebrated among the Moors for its healing qualities. The species thrive in loamy soil. They may be increased by seeds, or by breaks from the carrot-like root.

T. decipiens (deceiving). Black Parsley. *fl.* white; petals obovate, emarginate; involucre composed of many cut leaves. June and July. *l.* tripinnate; leaflets ovate, acuminate, serrated, the ultimate ones usually confluent; petioles sheathing. Stem terete, simple, naked below, shrubby. *h.* 6ft. Madeira, 1857. (B. M. 5670.)

T. edulis (edible). *fl.* white, small, disposed in compound, many-rayed umbels, furnished with partial and universal involucres of entire leaflets. May. *l.* large, decompound, fern-like, in tufts, from 1ft. to 3ft. in length (including the stalks). *h.* 4ft. Madeira, 1857. The roots, which have long, curved, horn-like divisions, and are black outwards and white within, are eaten in Madeira. SYN. *Monizia edulis* (B. M. 5724).

T. garganica (Garganian). Dias-plant. *fl.* yellow; involucre few-leaved. July and August. *l.* bi-tripinnatisect, shining; segments linear, acute, elongated, quite entire along the margins, decurrent or confluent. Stem terete, glabrous. *h.* 2ft. to 4ft. Mediterranean region, 1683. (B. M. 6293; S. F. G. 287.)

T. villosa (villous). *fl.* yellow; involucre and involucels almost wanting. June and July. *l.* tripinnate, and, as well as the petioles, villous; leaflets oblong, sinuately pinnatifid, the lower ones deflexed. Stem terete, glabrous. *h.* 3ft. to 4ft. South Europe, 1710.

THATCH PALMS. A native name for various species of *Euterpe*, *Sabal*, *Thrinax*, &c.

THEA. Included under **Camellia** (which *see*).

THECA. A synonym of **Tectona** (which *see*).

THECA. A spore-case; a sac, tube, shell, or any kind of case containing spores.

THECOSTELE (from *theke*, a receptacle, and *stele*, a column; in allusion to the shape of the gynostegium). ORD. *Orchideæ*. A monotypic genus. The species, a stove, epiphytal Orchid, native of Malacca and the Malayan Archipelago, and bearing a simple raceme of mediocre flowers, is as yet unknown in cultivation.

THELA. A synonym of **Plumbago** (which *see*).

THELEBOLUS (from the Greek works *thele*, a nipple, and *ballo*, I throw; in allusion to the form of the Fungus, and to the mode of ejecting the spores, described below). A small genus of Fungi, which spread over decaying leaves and sticks, and upon the soil in woods during winter. Only one species (*T. terrestris*) is known to be British, and this is by no means common. It forms yellowish patches, sometimes several inches in breadth, composed of a woolly mycelium, on which are numerous smooth, hemispherical bodies; each of these

Thelebolus—*continued.*

is about $\frac{1}{6}$in. in diameter, and is surmounted above by a prominent, round mouth. In these bodies the spores are formed, and when they are ripe for being scattered they are pushed, or thrown, from the mouth in a mass which resembles a small nipple in form; hence the name of the genus. When the spores have all been ejected, the top of the Fungus sinks in, so that it resembles a cup. This plant is not of any practical importance to gardeners, though the yellow patches formed by it render it very conspicuous.

THELEPHORA (from *thele*, a nipple, and *phero*, to bear; in allusion to nipple-like growths on the surface of the hymenium in some of the species). A genus of Fungi, most of which grow on the ground in woods. A few, however, are found on tree-trunks or stumps, and at times do mischief to the wood, burrowing between and through the annual rings of growth. *Thelephora* belongs to the group of Mushrooms in regard to the structure of the hymenium, or part on which the spores are formed, and in four spores being formed from each large cell of the hymenium (*see* **Mushrooms**); but it differs from the true Mushrooms in having the hymenium smooth, or bearing mere ridges or warty growths, instead of being spread over gills; and the texture is firm and dry—indeed, almost leathery.

The reproductive organs of *T. laciniata* appear on the diseased trunks in the form of horizontal, semicircular plates, attached by the middle to the bark or wood; a number of such plates uniting, and overlapping one another, to form a mass 4in. or more across. They are covered above with a coat of fibrous or scaly hairs, prolonged round the margins; and each bears the downy, warty hymenium on its lower surface. The whole mass is dull rusty-brown. This Fungus is usually found among the leaves and other plant-remains in the soil in woods; but it often grows closely around the stems or branches of young trees, and thereby kills small or weakly plants, although it is not a true parasite. It is unsafe to form nurseries for seedlings where *T. laciniata* abounds, though this species is seldom dangerous to older trees.

Dr. Hartig, the well-known German writer on the diseases of trees, has described (in the "Lehrbuch der Baumkrankheiten") a disease of Oak-trunks, widely met with in Germany, which he attributes to a Fungus, named by him *T. Perdix*. The specific name is the Latin word for a partridge, and alludes to the fact that the wood in which it grows often resembles in its mottlings the plumage of a partridge. The diseased wood turns to a deep red-brown, with numerous white spots of mycelium. These spots soon become closed cavities, which are lined with the pale threads of the Fungus. The wood rots, turning dark brown, and the cell walls and cell contents decay. The reproductive organs, which are the most readily recognised parts of the Fungus, are semicircular plates from $\frac{1}{20}$in. to $\frac{1}{2}$in. across, and of a brown-yellow colour; and they grow on the surface of dead branches, or in hollow spaces in the trunks. These plates continue to increase in size year after year. Though so frequent in Germany, *T. Perdix* does not appear to have been recorded as British.

Another Fungus formerly known as *T. hirsuta*, but now named *Stereum hirsutum*, is very frequent in Britain, on stumps and dead wood of many species of trees. It also is regarded by Dr. Hartig as at times very hurtful to Oak-wood. In general appearance it is much like a true *Thelephora*, but differs in having between the hymenium and its support (pileus) a fibrous layer that is not present in *Thelephora*. The reproductive bodies of *Stereum hirsutum* are somewhat like those of *T. laciniata* in general form; but they are usually pale, and are covered above with grey or pale down, and the hymenium

Thelephora—*continued.*

is yellowish. Where this Fungus gains an entrance into an Oak-trunk, the wood becomes brown, at first on one side, then gradually all round, in concentric layers. In the brown wood there next appear snow-white or yellowish, longitudinal streaks, which, in cross-sections of the trunk, show themselves in the form of small spots. Where air gains free access, through cracks, &c., the wood may become uniformly yellowish, the middle layer of the wall between the cells is dissolved out, and the tenacity of the wood is destroyed by the cells thus becoming separated. Fortunately, *Stereum hirsutum* does not often attack healthy trees. As is the case with almost all internal parasites, comparatively little can be done to cure the evil in a tree; though timely removal of diseased branches may prevent the mycelium from reaching the trunk. But, except in the case of choice specimens, the wise course is to remove and burn, without delay, such trees as show signs of being occupied by the Fungi, in order to prevent the latter from spreading to healthy plants.

THELESPERMA (from *thele*, a nipple, and *sperma*, seed; alluding to the nipple-like protuberances on the achenes). SYN. *Cosmidium*. ORD. *Compositæ*. A small genus (four or five species) of stove or greenhouse, glabrous herbs or sub-shrubs; one is found in extra-tropical South America, and the rest are Mexican. Flower-heads mediocre, heterogamous, on long peduncles; involucre duplex; ray florets, when present, yellow; disk often purplish; achenes glabrous, smooth or tubercled. Leaves opposite, or the upper ones alternate, linear, often filiform, once or twice pinnatipartite or the uppermost ones undivided. The species are probably not now in cultivation in this country.

THELIGONUM. *See* **Thelygonum.**

THELYGONUM (an old Greek name, from *thelygonos*, begetting girls; it was said by Pliny to give the power of producing female offspring). Sometimes spelt *Theligonum*. SYN. *Cynocrambe*. ORD. *Urticaceæ*. A monotypic genus. The species, *T. Cynocrambe* (Dog's Cabbage), is a hardy, slightly fleshy, procumbent, annual herb, broadly dispersed over the Mediterranean region. It is occasionally cultivated as a potherb, but has no value from a horticultural standpoint.

THELYMITRA (from *thelys*, a woman, and *mitra*, a cap; alluding to the hood-shaped column). Woman's-cap Orchid. Including *Macdonaldia*. ORD. *Orchideæ*. A genus comprising about twenty species of greenhouse, terrestrial Orchids, with ovoid tubers; one is broadly dispersed through Australia, New Zealand, New Caledonia, and the Malayan Archipelago, three or four are indigenous to New Zealand, and the rest are all Australian. Flowers blue, purple, red, or yellow, occasionally white, usually several in a terminal raceme; sepals, petals, and lip, all nearly equal and spreading; column rather short, erect, broadly winged; pollen masses granular; bracts shorter than the flowers. Leaves linear, lanceolate, or rarely ovate, sometimes rather thick, but not terete. Stems simple, one-leaved. A selection of the introduced species is given below. All of them are Australian. For culture, *see* **Bletia.**

T. carnea (fleshy). *fl.* pink, one to three; sepals and petals oval-elliptic, oblong, or obtuse, usually about four lines long. May. *l.* narrow-linear. Stem slender, often flexuous, less than 6in. to nearly 12in. high. 1820.

T. Forsteri (Forster's). A synonym of *T. longifolia*.

T. graminea (grass-like). A synonym of *T. longifolia*.

T. ixioides (Ixia-like). *fl.* blue, pedicellate, usually forming a raceme 4in. to 6in. long; sepals, petals, and lip, elliptic-oblong, nine to ten lines long. May. *l.* long-linear or linear-lanceolate, flat or channelled, with one or two shorter ones. Stem usually above 1ft. high. 1810. (S. E. B. 29.)

T. longifolia (long-leaved). *fl.* blue, lilac, or pink, rather large, several in a raceme; column wing produced behind and over

Thelymitra—*continued.*

the anther into a broad hood, usually conspicuous from its dark colour. May. *l.* long, narrow. *h.* variable, usually about 1ft. 1824. SYNS. *T. Forsteri, T. graminea, T. pauciflora.*

T. pauciflora (few-flowered). A synonym of *T. longifolia.*

T. variegata (variegated). *fl.* purple, two to four, large; sepals and petals lanceolate, shortly acuminate or acute, ¾in. to 1in. long, variegated. May and June. *l.* with a villous sheath, the blade usually glabrous, linear, much dilated at base and often undulated. Stem not very stout, 1ft. high or rather more. SYNS. *Macdonaldia spiralis, M. variegata.*

T. venosa (veined). *fl.* blue, six to ten; sepals and petals ½in. to ¾in. long; column broadly winged. April. *l.* long, narrow. Stem 1ft. to 2ft. high. 1826. SYN. *Macdonaldia venosa.*

THELYPOGON. A synonym of **Telipogon** (which *see*).

THEMISTOCLESIA (named in honour of the Greek statesman Themistocles). Including *Centrostemma.* ORD. *Vacciniaceæ.* A small genus (four species) of glabrous, villous, or pubescent, stove, evergreen shrubs, with slender, pendulous branchlets, inhabiting the Andes of Peru, Bolivia, and Venezuela. Flowers disposed in short racemes; calyx tube continuous with the pedicel, campanulate or obconical, the limb minutely five-toothed; corolla tubular, the base or middle of the tube slightly swollen, the limb small, with five recurved teeth; stamens ten, as long as the corolla. Leaves alternate, sub-sessile, rounded or cordate at base, ovate, long caudate-acuminate, coriaceous. *T. coronilla,* the only species calling for description here, thrives in a compost of turfy loam, peat, and sand. It may be increased by cuttings, which readily root in sand or soil, with or without the protection of a glass.

T. coronilla (small-crowned). *fl.*, calyx short, pale green; corolla dark red and shining, glabrous, narrow-urceolate or tubular and inflated below, obscurely five-angled; pedicels axillary, solitary or in pairs. January. *l.* numerous, spreading and deflexed, ½in. long, obtuse, entire, often glabrescent above, pale beneath. Branches stout, and, as well as the leaves, peduncles, and calyces, softly hairy. Venezuela, 1866. A small shrub. (I. H. n. s. 33.) SYN. *Thibaudia coronaria* (B. M. 5575).

THENARDIA (named by Kunth in honour of his friend L. J. Thenard, a Frenchman, who wrote on the chemical physiology of plants). ORD. *Apocynaceæ.* A monotypic genus. The species is an interesting, glabrous, stove, climbing shrub, requiring similar treatment to that recommended for **Dipladenia.**

T. floribunda (bundle-flowered). *fl.* pink, broad, in nearly umbelliform cymes; calyx somewhat five-parted; corolla tube very short, sub-rotate, the lobes five, broad, spreading, twisted; pedicels elongated. June. *l.* opposite, 2½in. to 3½in. long. Branches terete, slender. *h.* 10ft. Mexico, 1823.

THEOBROMA (from *theos,* god, and *broma,* food; referring to the well-known produce of the seeds of *T. Cacao*). SYN. *Cacao.* ORD. *Sterculiaceæ.* A small genus (about half-a-dozen species) of stove trees, inhabiting the warmer parts of America. Flowers rather small; calyx five-cleft or five-parted; petals five, cucullate-concave and contracted into a claw at base, produced above into a spathulate hood; stamens opposite the sepals; peduncles axillary or lateral, one-flowered and fascicled or racemosely many-flowered. Fruit often large, drupaceous, with a woody, five-celled stone; seeds enveloped with pulp. Leaves ample, oblong, undivided, penninerved or three to five-nerved at base. To dilate on the immense economic value of the seeds of *T. Cacao* would be beyond the scope of this work. It may be remarked, in passing, that the annual European consumption of Cacao seeds, in the form of chocolate, &c., is estimated at nearly 40,000,000lb., the Spaniards being the largest consumers. *T. Cacao* will thrive under the same treatment as that recommended for **Ticorea.**

T. Cacao. Cacao or Cocoa Plant; Chocolate Nut Tree. *fl.* fascicled; calyx rose-coloured, the segments lanceolate, acuminate, exceeding the yellowish corolla. May. *fr.* yellow or reddish, ovoid-oblong, 6in. to 8in. long, containing fifty to a hundred seeds. *l.* oblong, acuminate, glabrous, quite entire. *h.* 16ft. to 18ft. Trinidad, &c., 1739. (L. B. C. 545.)

THEODOLITE. An expensive levelling instrument, used by land surveyors for determining important levels and ascertaining the relative heights of objects widely separated from each other. It is provided with a telescope, mounted so that it can be moved to any angle, and a spirit level and adjusting screws for fixing the instrument in its proper position when in use. If the employment of a Theodolite is requisite in a garden, a surveyor generally supplies the instrument and superintends its management.

THEOPHRASTA (named after Theophrastus, the celebrated Greek botanist, who lived about 370-285 B.C.). ORD. *Myrsineæ.* A monotypic genus. The species is a glabrous, stove, evergreen shrub, with robust, erect, nearly simple stems. It thrives in a compost of peat and loam. Cuttings of half-ripened shoots will root in sandy loam, with a surface consisting wholly of sand, if placed in bottom heat, under a bell glass.

T. imperialis (imperial). A synonym of *Chrysophyllum imperiale.*

T. Jussæi (Jussieu's). *fl.* white, rather large, numerous in short racemes; calyx of five ovate, erect segments; corolla cylindrical-campanulate, five-lobed at apex, the lobes spreading; stamens five, affixed to the base of the corolla. *l.* sub-terminal, clustered, spreading, very shortly petiolate, linear-oblong, spiny-toothed, reticulate-nerved. *h.* 3ft. St. Domingo, 1818. (B. M. 4239.)

T. longifolia (long-leaved). A synonym of *Clavija ornata.*

T. macrophylla (large-leaved). A synonym of *Clavija Reideliana.*

T. smaragdina (emerald-green). A synonym of *Deherainia smaragdina.*

THERA (Carpet Moths). A genus of slender-bodied Moths, from 1in. to 1¼in. in spread of front wings, which are grey, with a broad, brown cross-band in the centre. The larvæ feed on the leaves of *Coniferæ*; but seldom do appreciable harm. *See also* **Pinus.**

THERESIA. Included under *Fritillaria.*

THERMIA. A synonym of **Thermopsis** (which *see*).

THERMOMETER. An instrument used for measuring the intensity of heat; one of the most useful and essential in gardens, particularly in glass houses, where the occupants have to be subjected to temperatures regulated to meet their several requirements. An ordinary Thermometer consists of a fine glass tube, with a bulb at one end. In this either some mercury or spirit is placed, and, as it expands or contracts in the tube, the amount of rise or fall in the temperature is indicated. When a Thermometer is made, all air is expelled from the tube and the end is hermetically sealed. The space not filled with the mercury or spirit is thus rendered vacuous, or nearly so, and there is no resistance to the expanding substance when the temperature rises. Every Thermometer tube is provided with a frame of some sort, on which the scale of degrees is marked, to denote the temperature which the expanding or contracting substance indicates. Fahrenheit's scale is in general use in this country; there are two others, known respectively as Reaumur's and the Centigrade; the last-named is generally adopted on the Continent. Fahrenheit's scale fixes the freezing-point at 32 deg., and the point at which water boils at 212 deg. In Reaumur's scale, freezing-point is Zero, and boiling-point 80 deg. In the Centigrade scale, the freezing-point is Zero, as in Reaumur's, but boiling-point is 100 deg. The three are, therefore, quite different to read, because of the spaces on the scales between freezing and boiling-points being differently divided.

There are various kinds of Thermometers in use where meteorological observations are taken; many of these are made in special ways, for special purposes: thus, a Maximum registers the highest, and a Minimum the lowest, temperature which has been experienced since the indicators in either of the instruments were last set;

Thermometer—*continued.*

a Solar Radiation is specially made for indicating the highest temperature in the sun's rays; and there is also a Minimum, for laying on the grass. In all gardens, a minimum registering Thermometer is most desirable, for ascertaining the lowest degree reached in frosty weather during any given period; it should be suspended in a position with north aspect, where there is a fair exposure. Ordinary Thermometers, if correctly graduated to the scale, are well adapted for all horticultural purposes under glass. There are also special ones made for use in Mushroom-beds, or other places where there is bottom heat.

THERMOPSIS (from *Thermos*, a Lupine, and *opsis*, resemblance; the species are not unlike Lupines). Syn. *Thermia.* Ord. *Leguminosæ.* This genus embraces about a dozen species of hardy, perennial herbs, natives of North America and Asia (Siberia and Himalayas). Flowers yellow or rarely purple, rather large, in terminal or leaf-opposed racemes; calyx teeth or lobes sub-equal, or the two upper ones connate in one; standard sub-orbicular; keel equalling, or slightly longer than, the wings; stamens free; pedicels solitary. Pods sub-sessile or shortly stipitate. Leaves perfectly alternate, digitately trifoliolate; stipules leafy. The following species have been introduced. They are elegant subjects, but rather difficult to preserve. They succeed best in a light, rich soil. Propagation is most safely effected by means of seeds; for when the plants are separated at the roots, they often decline.

Fig. 22. Thermopsis montana, showing Habit and detached Flower.

T. barbata (bearded).* *fl.* six to twelve, shortly pedicellate, opposite or ternate; corolla deep purple, 1in. long. June. *l.* sessile, sub-glabrescent, often opposite; leaflets oblanceolate; stipules resembling the leaflets both in texture and shape. Stems 1ft. or more high, copiously dichotomously branched. Rootstock woody. Himalayas, 1854. (B. M. 4868.)

T. corgonensis (Corgon). *fl.* yellow, twin on the racemes, nearly sessile; calyx villous. June and July. *l.* sessile or very shortly petiolate; leaflets ovate, acute; stipules constituting with the leaflets a kind of half-whorl. *h.* 1ft. to 2ft. Corgon Alps, 1820.

T. fabacea (Bean-like). A synonym of *T. montana.*

T. lanceolata (lance-shaped). *fl.* yellow, twin or somewhat whorled; calyx cleft to the middle; bracts large; racemes terminal. June and July. *l.* nearly sessile, the lower and the highest ones often simple; leaflets oblong-lanceolate, silky-puberulent on both sides; stipules half the length of the leaflets. *h.* 1ft. Kamtschatka, 1779. Syn. *Podalyria lupinoides* (B. M. 1389).

T. montana (mountain).* *fl.* yellow, alternate; racemes terminal. June and July. *l.* petiolate; leaflets broadly oval; stipules broadly ovate, obtuse, shorter than the petioles. *h.* 1ft. to 2ft. North America, 1818. See Fig. 22. (B. M. 3611; B. R. 1272; L. B. C. 1856.) Syn. *T. fabacea.*

T. nepalensis (Nepaul). A synonym of *Piptanthus nepalensis.*

THEROLEPTA. A synonym of **Marshallia** (which *see*).

THEROPOGON (from *theros*, summer, and *pogon*, a beard; in allusion to the time of flowering and the tuft-like appearance of the plant). Ord. *Liliaceæ.* A monotypic genus. The species is a greenhouse, herbaceous perennial, of tufted habit, with grass-like leaves and the general habit of *Anthericum*, of frequent occurrence in the Himalayas. The most suitable soil for the cultivation of this plant is one composed of sandy loam and leaf mould. Propagation may be effected by seeds, sown on a hotbed, during spring; or by divisions.

T. pallidus (pale).* *fl.*, perianth white, sometimes tinged with red, three to four lines long, the segments broad, imbricated; pedicels solitary; raceme terminal, loose, 2in. to 3in. long, ten to twenty-flowered; scape slender, firm, shorter than the leaves. Spring. *l.* six to eight, nearly 1ft. long, persistent, glabrous, two to three lines broad, distinctly ribbed, green above, glaucous beneath. 1875. (B. M. 6154.)

THESIUM (*Thession* was the old Greek name used by Theophrastus for this or some similar plant; probably derived from Theseus, the legendary hero). Ord. *Santalaceæ.* A large genus (over 100 species) of stove, greenhouse, or hardy herbs, natives of temperate and tropical regions: two are found in Brazil; the rest are wholly absent in America. Flowers spicate or racemose, or one to a peduncle, or forming a compound, cymose inflorescence. Leaves alternate, linear, often small, sometimes reduced to minute scales. A few of the species have been introduced, but they are unworthy of cultivation.

THESPESIA (from *thespesios*, divine; *T. populnea* is frequently planted about churches in the tropics). Ord. *Malvaceæ.* A small genus (about half-a-dozen species) of stove trees or tall herbs, found in tropical Asia, the Pacific Islands, and Madagascar. Flowers often yellow, showy; calyx not conspicuously dotted, truncate, rarely five-cleft; ovary five-celled. Leaves entire or angular-lobed. Two species have been introduced; both are trees. They thrive in a compost of loam and peat. Ripened cuttings will root freely in sand or mould, under a hand glass, in heat.

T. grandiflora (large-flowered). *fl.* red, 4in. to 5in. in diameter, on pedicels 4in. long. May. *l.* ovate, rather cordate, slightly acuminate. *h.* 30ft. Porto Rico, 1827. In habit, this species resembles *T. populnea.*

T. populnea (Poplar-like). Mahoe; Portia-nut Oil-plant; Umbrella-tree. *fl.* at first yellow, with a purple central spot, but changing altogether to purple before they die off in the evening; pedicels 1½in. to 2in. long; peduncles equalling the petioles. June. *l.* roundish-cordate, acuminate, five to seven-nerved, covered beneath with dot-like scales. *h.* 40ft. Tropics of Old World, 1770.

T. p. guadalupensis (Guadaloupe). *fl.*, petals narrower than in the type, fringed at base; pedicels 1in. long. Cultivated in Guadaloupe.

THEVETIA (so called after Andr. Thevet, 1502-1590, a French monk, who travelled in Brazil and Guiana). Ord. *Apocynaceæ.* A genus embracing about eight species of glabrous, stove, American shrubs or small trees, extending from Paraguay to Mexico. Flowers yellow, large, in terminal cymes; calyx five-parted, with acute, spreading segments; corolla funnel-shaped, the cylindrical tube abruptly expanded into a campanulate throat, the lobes broad and twisted; stamens inserted at the apex of the tube. Drupe broader than long. Leaves alternate, one-nerved or slenderly penniveined. Three species are known to cultivation. They thrive

Thevetia—*continued.*

in fibrous loam. Propagation may be effected by cuttings, inserted in sand, under a bell glass, in heat.

T. Ahouai (Ahouai). *fl.* pale yellow, on thick pedicels; corolla ribbed, with spreading lobes; pedicels thick, as long as the calyx; cymes terminal, contracted, many-flowered. June. *l.* oblong-obovate, acute, acuminate at base, 4in. long, highly glabrous above, sparsely pilose beneath. *h.* 20ft. Brazil, 1739. SYN. *Cerbera Ahouai* (A. B. R. 231; B. M. 737).

T. neriifolia (Oleander-leaved). Exile Oil Plant. *fl.* saffron-yellow, about 3in. long; calyx segments about half the length of the cylindrical part of the corolla, which is one-third the length of its enlarged throat; cymes sub-terminal, much shorter than the leaves, few or sometimes one-flowered. June. *l.* linear, glabrous, shining above, 3in. to 6in. long. *h.* 12ft. Tropical America and West Indies, 1735. SYN. *Cerbera Thevetia* (B. M. 2309).

T. Yccotli (Yccotli). *fl.* similar to those of *T. neriifolia*, 3in. long; corolla lobes three times the length of the tube; cymes sub-terminal, one to three-flowered. June. *fr.* green, warted, the size of a small apple. *l.* narrow-linear, acuminate at both ends, the margins revolute, glabrous above, slightly pilose beneath. *h.* 8ft. Mexico, 1800.

THIBAUDIA (named in honour of Thiebaut de Berneaud, Secretary of the Linnean Society of Paris, and a botanical writer). ORD. *Vacciniaceæ*. A genus to which only a couple of species are referred by Bentham and Hooker; they are very elegant, stove shrubs, natives of the Andes of New Grenada and Peru. Flowers scarlet, pedicellate, numerous, in axillary racemes; calyx tube continuous with the pedicel, terete, the limb short, obtusely five-lobed or five-toothed; corolla tubular, terete, the limb of five small, sub-erect lobes; stamens ten, as long as the corolla tube; pedicels bracteate at base, and sometimes bracteolate. Leaves alternate, persistent, petiolate or sub-sessile, coriaceous, penninerved, entire. The species thrive in a compost of turfy loam, peat, and sand. Cuttings will readily root in sand or soil, with or without the protection of a glass. Other species formerly included here will now be found under **Proclesia, Psammisia, Themistoclesia,** &c.

T. floribunda (bundle-flowered). *fl.* glabrous, on very long pedicels; racemes solitary, nearly 2in. long, with imbricated bracts at base. *l.* oblong-lanceolate, acuminate, reticulate-veined. Branches nearly terete, smooth, greyish. New Grenada.

T. pichinchensis (Pichinchan). *fl.* seven lines long; calyx furfuraceous-tomentose, the teeth mucronulate; corolla glabrous; racemes shorter than the leaves. *l.* very shortly petiolate, oval-oblong or sub-lanceolate, obtuse and acuminate, rounded at base, 3in. to 4in. long. *h.* 6ft. to 12ft. Pichincha, 1849.

THICK-LEAF. A common name for **Crassula** (which *see*).

THIEBAUTIA. A synonym of **Bletia** (which *see*).

THIMBLEBERRY. *See* **Rubus occidentalis.**

THINNING-OUT. A common term which refers to the work of reducing the number of seedlings of any description when they are too much crowded for the proper development of all. It should be attended to, amongst seedlings, at an early stage, if it is necessary at all, else the whole lot may become drawn, and thereby weakened. Thinning-out also applies to the cutting of shoots or branches—as, for instance, on fruit-trees—and to the reduction in quantity of various other subjects when the space is only available for a portion of the whole.

THISTLE. A common name for the species of *Carduus* and *Cnicus*, and other plants.

THISTLE, BLESSED. *See* **Silybum Marianum.**

THISTLE, COTTON. *See* **Onopordon Acanthium.**

THISTLE, GLOBE. *See* **Echinops.**

THISTLE, GOLDEN. *See* **Scolymus hispanicus.**

THISTLE, HEDGEHOG. *See* **Echinocactus.**

THISTLE, HOLY. *See* **Silybum Marianum.**

THISTLE, MELON. *See* **Melocactus.**

THISTLE, OUR LADY'S MILK. *See* **Silybum Marianum.**

THISTLE, SOW. *See* **Sonchus.**

THLADIANTHA (from *thladias*, compressed, and *anthe*, a flower; owing, it is said, to the plant being first described from a pressed specimen!). ORD. *Cucurbitaceæ*. A genus including three or four species of climbing, greenhouse or hardy herbs, natives of North China, Java, and the Himalayas. Male flowers golden, rather large, solitary or racemose; calyx tube shortly campanulate, the bottom shut by a horizontal scale, the segments five, lanceolate; corolla campanulate, five-parted, the segments revolute about half-way down; filaments five. Female flowers solitary; calyx and corolla as in the males; ovary oblong; style deeply trifid, with three reniform stigmas. Fruit green, oblong, fleshy, many-ribbed. Leaves ovate-cordate, with a deep sinus, denticulate. *T. dubia*, the only species introduced, will thrive in almost any soil, but perhaps succeeds best when planted against a sunny wall.

T. dubia (doubtful).* *fl.*, males approximate; calyx teeth very narrow; petals ⅔in. long; filaments minutely hairy; racemes 2in. to 3in. long, with prominent bracts; female peduncle 2in. to 3in. long, more or less hairy, the ovary densely woolly. *fr.* 1½in. by ¾in., glabrous, obtuse at both ends. *l.* deeply cordate-ovate, acute, undivided, 4in. by 2½in., denticulated, not angular, usually villous beneath; petioles 1in. to 1½in. long. Hardy. India and China, 1864. (B. H. 1872, 6; B. M. 5469; in both these figures, however, the female flower and fruit belong to another species.

THLASPI (probably from *Thlaspis*, the old Greek name for Cress, used by Dioscorides, from *thlas*, to bruise; its seeds being bruised as a condiment). Bastard Cress; Besom Weed; Penny Cress. ORD. *Cruciferæ*. A genus comprising from twenty-five to thirty broadly-distributed species of annual or perennial, scapigerous herbs. Flowers white, pink, or pale purple, racemose. Radical leaves rosulate; cauline ones hastate-auriculate. None of the species are worth cultivating. *T. alpestre*, *T. arvense* (Boor's or Mithridate Mustard), and *T. perfoliatum* are British weeds.

THOMASIA (named in memory of Peter and Abraham Thomas, collectors of Swiss plants in the time of Haller). ORD. *Sterculiaceæ*. A genus comprising twenty-five species of very elegant, Australian, greenhouse shrubs, with the habit of *Lasiopetalum*, but with the leaves often lobed or cut. Flowers often tomentose; calyx usually purple, bluish, or white, five-lobed; petals none, or minute and scale-like; stamens five, alternate with the sepals, free or slightly connate at the base; bracts narrow, deciduous; bracteoles under the calyx three; racemes leaf-opposed, simple or rarely cymosely branched. Stipules leafy. The under-mentioned species are well worth cultivating in every collection. They thrive in a compost of loam, peat, and sand. Cuttings of the ripened wood will root freely in sand, under a glass.

T. foliosa (leafy). *fl.* small, on slender pedicels; petals none; racemes numerous, often branched, slender, hirsute. June. *l.* petiolate, ovate-cordate, deeply sinuate-lobed, rarely above 1in. long, sprinkled with stellate hairs above, more densely hirsute beneath. *h.* 3ft. 1823.

T. glutinosa latifolia (glutinous, broad-leaved). *fl.* pink, pretty, disposed in racemes; stamens, as well as a blotch at the base of the petals, dark brownish. Summer. *l.* stalked, cordate, acute, covered with stellate hairs. 1885. An attractive plant. (R. G. 1186.)

T. grandiflora (large-flowered). *fl.*, calyx red, spreading to about 1in. in diameter, not divided to the middle; petals none; racemes terminal. June. *l.* mostly ovate-lanceolate or oblong, or the lowest ovate, obtuse, ½in. to 1in. long, entire, cordate or obscurely three-lobed at base, glabrous or sprinkled with a few stellate hairs. *h.* 3ft. 1810.

T. macrocarpa (large-fruited).* *fl.*, calyx red, opening to about 1in. in diameter, loosely woolly-hirsute outside; racemes tomentose-hirsute, few-flowered. June. *l.* broadly ovate-cordate,

Thomasia—*continued.*

obtuse, 1½in. to 2in. long, irregularly angular-toothed or shortly lobed, pubescent above when young, at length glabrous, tomentose beneath. *h.* 3ft. or more. 1842. (B. M. 4111, under name of *T. stipulacea.*)

T. purpurea (purple). *fl.* rather small, on very short pedicels; calyx purple, about ½in. in diameter; petals small, occasionally wanting; racemes longer than the leaves. June. *l.* oblong or nearly linear, obtuse, ½in. to 1in. long, entire, sprinkled with stellate hairs above, more hirsute beneath, or rarely nearly glabrous. *h.* 2ft. 1803. SYN. *Lasiopetalum purpureum* (B. M. 1755).

T. quercifolia (Oak-leaved). *fl.* rather small; calyx purple, the lobes not reaching the middle, broad and obtuse; petals none; racemes simple. May. *l.* ovate, usually deeply three-lobed, the lateral lobes short, divaricate, and often obtusely three-lobed, the middle one longer, often three-lobed, the whole leaf rarely exceeding 1in., sprinkled with stellate hairs above, rigidly hirsute beneath. *h.* 2ft. 1803. SYN. *Lasiopetalum quercifolium* (A. B. R. 459; B. M. 1485).

T. solanacea (Solanum-like). *fl.*, calyx white, more or less tomentose, about ½in. in diameter, divided to rather below the middle; petals usually wanting; racemes pedunculate, several-flowered, occasionally branched. June. *l.* deeply cordate-ovate, obtuse, mostly 1½in. to 3in. long, rather deeply sinuate-lobed, scabrous or hirsute above, softly and densely tomentose or hirsute beneath. *h.* 3ft. and upwards. 1803. SYN. *Lasiopetalum solanaceum* (B. M. 1486).

T. stipulacea (prominent-stipuled). A synonym of *T. macrocarpa.*

THOMSONIA (named in honour of Dr. A. T. Thomson, author of "An Introduction to Botany"). SYN. *Pythonium.* ORD. *Aroideæ* (*Araceæ*). A genus including only a couple of species of stove, tuberous, perennial herbs, natives of the Himalaya and Khasya Mountains. Flowers monœcious, the males and females closely contiguous; spathe coriaceous, deciduous, oblong, boat-shaped, with an indistinct tube; spadix sessile, nearly equalling the spathe; peduncle elongated. Leaves long-petiolate, tripedatisect; segments pinnatipartite; pinnæ oblong-lanceolate, acuminate. For culture, *see* **Caladium.**

T. Hookeri (Hooker's). *fl.*, female inflorescence rather shorter than the male; peduncle elongated, slender. *l.* seven-pedatisect; segments oblong-lanceolate, acuminate, cuneate-narrowed towards the base, distant, gradually becoming smaller; petiole elongated, slender, spotted. Tuber small. *h.* 2ft. Churra, 1840.

T. nepalensis (Nepaul). *fl.*, spathe greenish, oblong-cymbiform, obtuse, coriaceous, thick; spadix green, the perfect male flowers purplish-yellow, the sterile ones yellow. *l.* trisected; middle segment pseudo-dichotomous, the partitions pinnatipartite, the segments alternate, oblong-lanceolate, acuminate, cuneate at base, decurrent; nerves of the lateral segments numerous, spreading; petioles reddish below, irregularly spotted and mottled with fuscous-green. Tuber large. *h.* 2ft. Nepaul, 1816.

THORN. A common name for various species of *Acacia, Cratægus,* &c.

THORN. The same as **Spine** (which *see*).

THORN APPLE. *See* **Datura Stramonium.**

THORN BROOM. *See* **Ulex europæus.**

THORN, CHRIST'S. *See* **Paliurus aculeatus** and **Zizyphus Spina-Christi.**

THORN, GARLAND. *See* **Paliurus aculeatus.**

THORN, GOAT'S. *See* **Astragalus Tragacantha.**

THORN, JERUSALEM. *See* **Parkinsonia aculeata.**

THOUINIA (named in honour of André Thouin, 1747-1824, Professor of Agriculture at Paris). SYNS. *Thyana, Vargasia.* ORD. *Sapindaceæ.* A genus consisting of about a dozen species of stove, erect or climbing shrubs or trees, inhabiting tropical America. Flowers small or minute, racemose, cymose, or paniculate; calyx five-parted; petals four, five, or absent; stamens eight to ten. Leaves alternate, exstipulate, trifoliolate or pinnate, rarely one-foliolate. Only one species has been introduced. For culture, *see* **Ticorea.**

Thouinia—*continued.*

T. pinnata (pinnate-leaved). *fl.* white, disposed in terminal panicles, and having five petals and eight stamens. June. *l.* pinnate; leaflets oblong, slightly emarginate. *h.* 8ft. St. Domingo, 1823. Erect.

THOUSAND-LEGS. A common name for **Millipedes** (which *see*).

THREE BIRDS ORCHIS. *See* **Pogonia pendula.**

THREE FACES UNDER A HOOD. *See* **Viola tricolor.**

THRIFT. *See* **Armeria.**

THRINAX (from *thrinax,* a fan; alluding to the form of the leaves). ORD. *Palmæ.* A genus comprising about ten species of stove, mediocre or dwarf, unarmed Palms; one is a native of Florida, and the rest inhabit the Antilles. Flowers sometimes long and slender, pedicellate; spathes many, papery-coriaceous, cut; spadices elongated, the rachis clothed with a tubular sheath, the primary branches alternate, paniculate, the branchlets slender. Fruit small, pea-like. Leaves terminal, orbicular or truncate at base, flabellately plicate and multifid; segments induplicately bifid; petioles slender, biconvex. Trunks solitary or tufted, annulated below, above covered with the persistent bases of fallen leaves. The genus includes some very beautiful plants, the best-known of which are here described. They succeed best, when young, in a compost of loam, peat, and sand; as they get older, turfy loam and sand is preferable. Propagated by seeds, which, like all Palm seeds, should be obtained when freshly imported, sown in well-drained pots or pans of sandy loam, and plunged in bottom heat.

T. argentea (silvery). Broom Palm; Silver Thatch, &c. *fl.*, partial spathes three or four only; spadix 1ft. long, slightly paniculate. *fr.* small. *l.* shorter than the petioles, silvery-silky beneath; divisions united at the base; ligule concave, somewhat crescent-shaped. Trunk 12ft. to 15ft. high, 2in. to 3in thick. West Indies, 1830.

T. barbadensis (Barbados).* *fl.*, spadix paniculate, 2ft. long. *fr.* ¼in. in diameter. *l.* green, glabrous, very large, fan-shaped or digitate-multipartite; segments lanceolate, acuminate; petioles covered with a thick felt of small, white scales, and edged with black, hooked, ascending spines. Trunk 12ft. high. Barbados, 1875.

T. elegans (elegant). A garden synonym of *T. radiata.*

T. excelsa (tall). *fl.*, spathe rusty-tomentose; spadix with spreading-recurved branches, its axis 1ft. long, naked below. *fr.* globose, ¼in. in diameter. *l.* 4ft. to 5ft. long, pale green above, hoary-glaucous beneath by minute, appressed down, about fifty-cleft; divisions about 2ft. long, 1in. to 3in. broad, united to about one-third their length. *h.* 7ft. and upwards. Jamaica, 1800.

T. gracilis (slender). A garden synonym of *T. radiata.*

T. graminifolia (grass-leaved). A synonym of *T. multiflora.*

T. multiflora (many-flowered).* *fl.*, primary spathes twelve to fifteen, tubular, obliquely opening, acute, longitudinally nerved; secondary spathes funnel-shaped, compressed at base; spadices erecto-patent. *l.* six to ten, erecto-patent, sub-orbicular, peltately radiate; segments forty or more, united half-way, the middle ones 2½ft. to 3ft. long, 2½in. broad at base, the free part ensiform, long-acuminate, flat, acutely bifid at apex; sheaths 6in. to 9in. long. Caudex 6ft. to 8ft. high, 4in. to 5in. thick, deeply and irregularly annulate. Haiti. SYN. *T. graminifolia* (I. H. n. s. 187).

T. parviflora (small-flowered).* Palmetto Thatch; Royal Palmetto Palm. *fl.*, perianth minute; spadix 2ft. to 3ft. long, paniculate. *fr.* dry, rather rough, ¼in. in diameter. *l.* puberulous, glabrate and green beneath, 10in. to 2ft. long; divisions united one-sixth to one-quarter their length; ligule deltoid. Trunk 10ft. to 12ft. high. Jamaica, 1778.

T. pumilio (dwarf). *l.* digitately multipartite; segments ensiform, acuminate, green on both sides, the middle nerve ferruginous-ramentaceous beneath, the secondary ones six to eight, impressed on both sides; ligule triangular. Trunk short or mediocre. Trinidad, 1830.

T. radiata (rayed).* *fl.*, spadix 2ft. to 3ft. long, paniculate. *l.* green, glabrous or puberulous beneath, 1ft. to 2ft. long; divisions united to or beyond one-third their length; ligule broadly rounded, with a short, blunt appendage at the middle. Trunk short. Trinidad, 1838. See Fig. 23, p. 30. SYNS. *T. elegans* and *T. gracilis* (of gardens).

THRINCIA. Included under *Leontodon.*

THRIPS (a Greek word for a moth). The name given to a group of small insects that often do much harm to cultivated plants, by gnawing the surface of flowers and tender twigs and leaves, thus causing withered and distorted spots to appear on them. The genus *Thrips*, along with certain closely-related genera,

FIG. 23. THRINAX RADIATA (see page 29).

is ranked in a family known as the *Thysanoptera* (from *thysanoeis*, fringed, and *ptera*, wings), or as *Physopoda* (from *physa*, a bladder, and *poda*, feet). Both names allude to characteristic features in the structure of the fully-developed insects. Thrips are very common in flowers, crawling about the interior of the corolla tube, and over the stamens, or living upon or in the fruits, or on the lower surface of the leaves. They feed upon the more delicate parts of the plants, causing them to become withered and blighted. The mature insects are very small, and are black or dark-coloured. They are long and narrow, and are furnished with four straight, narrow wings, which are fringed with long hairs, and have few, if any, veins (see Fig. 24). They have three pairs of legs, on which the last joints end in a bladder-like swelling without claws. The mouth is provided with parts suited for piercing delicate tissues of plants, and for sucking their juices. The earlier stages in the de-

Thrips—*continued.*

velopment of the species of *Thrips* are much like the mature insects, save in colour (which is usually dull yellow), and in the wings being entirely absent from the larvæ, and represented only by short wing-cases in the pupæ. The structure just described renders the order intermediate between *Orthoptera* (to which Grass-hoppers, Locusts, &c., belong) and *Hemiptera*. *See* **Insects.**

FIG. 24. THRIPS (magnified).

Many species have been described, so much alike as to render it very hard to distinguish them from each

Thrips—*continued.*

other; but gardeners do not require to spend time in determining their identity, as the habits of all are much alike, and the treatment is similar for all. The genera are distinguished chiefly by the presence or absence of veins in the wings, the hairy coating on the body, and differences of minor importance. One of the most hurtful kinds is *Heliothrips hæmorrhoidalis* (? *H. Adonidum*, Hal.), which injures plants in hothouses, as well as in winter gardens. The leaves become paler in colour, or turn black, and fall off. The young twigs also are frequently attacked and killed. This species is dark brown, with the tip of the body red-brown, and the eyes and limbs pale yellow. It is only about $\frac{1}{20}$in. long.

Remedies. Smoking the plants with tobacco, as for Aphides, or with insect-powder, washing them with infusion of tobacco, dipping them in soapy water, and keeping them for a time in the open air in summer, are methods that have been tried with success. There are no good remedies against the species of *Thrips* that feed on plants cultivated in the open air; but, fortunately, their attacks are seldom very hurtful to hardy plants. Choice subjects may be freed from their attacks by drawing the leaves between the finger and thumb, with sufficient pressure to crush the soft larvæ, but not to injure the leaves.

T. Phylloxeræ has been observed, in the United States of America, depositing eggs in the galls of *Phylloxera vastatrix* (*see* **Grape or Vine Louse**). The larvæ hatched from these eggs destroy multitudes of the *Phylloxera*.

THRIXSPERMUM. A synonym of **Sarcochilus** (which *see*).

THROAT. The orifice of a gamopetalous flower.

THROAT-ROOT. *See* **Campanula Cervicaria.**

THROATWORT. *See* **Trachelium.** The name is also applied to *Campanula Cervicaria* and *Digitalis purpurea*.

THRUST-HOE. Another name for the Dutch Hoe, a tool which the workman pushes from him when using

FIG. 25. THRUST-HOE.

it (see Fig. 25). It is well adapted for light work on a fairly even surface, and for hoeing flower-beds, &c., when it is necessary to loosen the surface, while standing upon the adjoining walk, instead of on the soil. *See* **Hoes and Hoeing.**

THRYALLIS (the old Greek name used by Theophrastus for *Verbascum*; it means a wick, and was appropriate enough to the original plant, but not to the present). ORD. *Malpighiaceæ*. A small genus (three species) of stove, climbing, stellately hoary-pubescent, Brazilian shrubs. Flowers yellow; calyx five-parted, without glands; petals shortly clawed, glabrous, the limb fringed; stamens ten, all perfect; pedicels bibracteolate, articulated above the base; corymbs paniculate, axillary and terminal, effuse. Leaves opposite, entire, glabrous above, whitish beneath; petioles biglandular; stipules inconspicuous. Only one species is known in gardens. It thrives in a compost of loam and peat. Ripened cuttings will root in sand, under a hand glass, in heat.

T. brachystachys (short-spiked). *fl.* disposed in short, paniculate racemes. August. *l.* ovate-lanceolate, glaucous-green above, white beneath. 1823. (B. R. 1162.)

THRYPTOMENE (from *thrypto*, to break or crush; in allusion to the humble, Heath-like aspect of the plant). ORD. *Myrtaceæ*. A genus comprising seventeen species

Thryptomene—*continued.*

of greenhouse, Heath-like, glabrous, Australian shrubs. Flowers small, axillary, solitary or rarely in twos or threes; calyx five-lobed, persistent; petals five, persistent, usually connivent over the stamens; stamens five or ten. Leaves opposite, small, entire. The only species introduced was formerly included under **Bæckea** (which *see* for culture).

T. saxicola (rock-loving). *fl.* white, on slender pedicels $\frac{1}{8}$in. long, in the upper axils. July. *l.* obovate-oblong, flat, obtuse or slightly acute, $\frac{1}{8}$in. to $\frac{1}{4}$in. long, the midrib scarcely conspicuous. *h.* 3ft. to 4ft. (rarely diffuse or prostrate?). 1824. SYN. *Bæckea saxicola* (B. M. 3160).

THUJA. *See* **Thuya.**

THUNBERGIA (named after of C. P. Thunberg, 1743-1822, a traveller in Batavia and Japan, and afterwards Professor at Upsala). Including *Hexacentris* and *Meyenia* (of Nees). ORD. *Acanthaceæ*. A genus embracing nearly thirty species of beautiful, stove, twining or dwarf and sub-erect, annual or perennial herbs, inhabiting South and tropical Africa, Madagascar, and the warmer parts of Asia. Flowers purple, blue, yellow, or white, shortly pedicellate, solitary in the axils, or disposed in terminal racemes; calyx annular, short, truncate or ten to fifteen-toothed; corolla conspicuous, the tube ventricose,

FIG. 26. THUNBERGIA ALATA, showing Habit and Portion of Flowering Branch.

curved, the limb oblique, of five rounded lobes, twisted to the left in bud; stamens four, didynamous near the base of the corolla tube; disk cushion-shaped or annular; bracts at the base of the pedicels leaf-like; bracteoles large, the margins coherent, at least when young. Capsule thickly coriaceous, suddenly narrowed into a sword-shaped beak. Leaves opposite, ovate, lanceolate, cordate, or hastate. The best-known species are here described; all are perennial, except where otherwise stated. Nearly all flower during the summer months, but some of the woody ones blossom in spring or late winter. The plants are of easy culture in any moderately good soil, but thrive best in a rich compost of fibrous loam and sand, to which may be added a small quantity of well-decayed manure. If the plants are grown in a brisk, moist, stove temperature, and the pots well drained, success is assured. Attention must be directed to pruning unsightly or bare shoots, before growth commences in spring, or else the plants will become straggling. Propagated by seeds, and also by cuttings of moderately firm young wood, placed in a propagating frame, with a temperature of from 65deg. to 70deg. *T. alata* and its varieties succeed under warm greenhouse treatment, and may readily be raised from

Thunbergia—*continued.*

seeds, sown in 5in. pots, in March or April. When large enough to pot off, the seedlings may be placed singly in other pots or in baskets, when they will soon grow into flowering specimens. A rather rich soil—loam and leaf mould or decayed manure, in the proportion of one part of the latter to two of the former—will suit admirably. In the young stages of growth, the plants should be subjected to stove treatment. When in flower, these Thunbergias are admirably adapted for edging groups, of plants along with other dwarf-growing subjects.

T. alata (winged).* *fl.*, calyx twelve-cleft above the middle ; corolla yellow, purple below, 1½in. long, the tube curved, the limb campanulate ; stigma funnel-shaped, entire, ciliated. *l.* cordate-sagittate, acute, repand, with a rather broad sinus, the lobes diverging, acute or mucronate ; petioles winged. South Africa, 1823. A softly silky-villous, canescent annual twiner. See Fig. 26. (B. M. 2591 ; H. E. F. 17.) There are a few varieties, of which the principal are : *alba* (B. M. 3512 ; P. M. B. ii. 2 and iii. 28 ; S. B. F. G. ser. ii. 392), with white, and *aurantiaca* (L. B. C. 1045 ; H. E. F. 177 ; B. v. 238), with deep yellow, flowers.

T. a. Doddsii (Dodds'). *fl.* yellowish-orange, with an eye of rich purplish-violet, large. *l.* irregularly bordered with white. (F. d. S. 415.)

T. angulata (angular). *fl.*, calyx twelve-parted ; corolla pale blue with a yellow throat, 1in. long, the tube very short, the limb campanulate-infundibuliform, the segments rounded ; bracteoles ovate, acuminate. *l.* on long petioles, cordate-sagittate, 1½in. long, ¾in. broad, with a deep sinus ; segments truncate, slightly mucronate, long-acuminate. Madagascar, 1823. A scabrous-pubescent climber. (H. E. F. 166 and 177, f. 3 ; L. B. C. 1044.)

T. capensis (Cape). *fl.* yellow ; calyx limb many-toothed ; corolla tubular-campanulate. *l.* nearly round, slightly toothed, obtuse, very shortly petiolate, and, as well as the procumbent stems, hairy. Cape of Good Hope, 1824. Annual. (L. B. C. 1529.)

T. chrysops (golden-eyed). *fl.*, calyx slightly fleshy, truncate ; corolla campanulate-infundibuliform, the tube yellow, much contracted at base, expanded above, the limb of a beautiful purple, with a blue ring ; peduncles axillary, solitary, shorter than the petioles, one-flowered. *l.* cordate-angular, rather obtuse with a mucrone, slightly pubescent-scabrous. Stem slender, puberulous. *h.* 3ft. Sierra Leone. Annual. (B. M. 4119 ; F. d. S. i. 5 ; P. M. B. 221.)

T. coccinea (scarlet).* *fl.*, calyx a minute rim ; corolla varying from red to orange-rose, 1in. long, the lobes ¼in. round ; racemes 6in. to 18in. long, loose, pendent ; bracts and bracteoles ¼in. to 1in. long. Spring. *l.* 5in. to 8in. long, the lower ones ovate, the upper ones oblong, obtuse, cordate or angular at the base, acuminate, toothed ; petioles ½in. to 2in. long, or wanting in the uppermost leaves. Pendent branches often 10ft. to 25ft. long. India, &c., 1823. A large, nearly glabrous climber. (B. M. 5124 ; F. d. S. 2447 ; H. E. F. 195 ; L. B. C. 1195.)

T. erecta (erect).* *fl.* axillary, solitary ; corolla dark blue, with a rich orange throat and pale yellow tube, four times the length of the bracts. July. *l.* opposite, ovate or oblong, smooth, dark green. *h.* 6ft. West Africa, 1857. A very continuous blossomer, producing flowers nearly throughout the whole year. SYN. *Meyenia erecta* (B. H. vii. 18 ; B. M. 5013 ; F. d. S. 1093 ; I. H. iii. 99 ; R. H. 1863, 251). The variety known as *alba* has white flowers with a yellow tube, but in other respects resembles the type.

T. fragrans (fragrant).* *fl.*, calyx ⅛in. long, twelve to sixteen-toothed ; corolla pure white, fragrant, 1¼in. long ; pedicels 1in. to 3in. long, one or rarely two in each axil ; bracteoles ⅔in. long, broadly falcate-oblong. *l.* ovate or oblong, acute or obtuse, cordate or hastate at base, toothed, glabrous when mature, 2in. to 3in. long ; petioles ½in. to 1in. long. Stem slender, climbing, retrorsely hairy or glabrate. India, &c., 1796. (A. B. R. 123 ; F. M. 325 L. B. C. 1913.)

T. f. lævis (smooth). *fl.*, corolla not fragrant, the tube often greenish ; pedicels often two in each axil, much thickened upwards in fruit. Plant glabrous or grey-puberulous. (B. M. 1881, under name of *T. fragrans.*)

T. grandiflora (large-flowered). *fl.*, calyx nearly entire ; corolla blue, 2in. to 3in. long and broad ; pedicels ½in. to 3in. long, opposite or fascicled ; racemes usually stout, rarely slender and elongated, nearly glabrous ; lower bracts often petioled, leaf-like. *l.* ovate, or the uppermost ones lanceolate, 6in. long, acute, cordate at base, toothed, often angularly lobed, pubescent, rarely glabrate ; petioles 3in. long. India, &c., 1820. A large climber. (B. ii. 76 ; B. M. 2366 ; B. R. 495 ; L. B. C. 324 ; P. M. B. vii. 221.)

T. Harrisi (Harris'). A synonym of *T. laurifolia.*

T. Hawtayneana (Hawtayne's). *fl.* axillary ; calyx a mere ring ; corolla violet purple, with a yellowish tube, 1½in. long, nearly glabrous ; pedicels short, solitary, with a tuft of hairs at their base ; bracteoles ⅔in. to 1in. long, ovate-oblong. *l.* sessile, cordate-elliptic or cordate-ovate, acute, entire, 3in. long, 1½in. broad. Stem slender. India, &c., 1839. A handsome, nearly glabrous climber. SYN. *Meyenia Hawtayneana* (B. iv. 188 ; P. M. B. vi. 147).

Thunbergia—*continued.*

T. Kirkii (Kirk's). *fl.* in short, two-flowered cymes ; corolla 1½in. long, the lobes violet-blue, spreading, but not horizontally, broadly obovate, retuse. September. *l.* 1½in. to 3in. long, shortly petiolate, lanceolate, sub-acute or obtuse, entire or with each side dilated into an obtuse lobe. *h.* 2ft. to 3ft. Eastern Tropical Africa, 1876. Shrub. (B. M. 6677.)

FIG. 27. FLOWERING BRANCH OF THUNBERGIA LAURIFOLIA.

T. laurifolia (Laurel-leaved).* *fl.* as in *T. grandiflora* (which this species closely resembles). *l.* elliptic or oblong, acuminate, sinuate or denticulate, palmately three-nerved. India, &c., 1856. Plant glabrous, or the new parts puberulous. Perennial. A tall climber. See Fig. 27. (B. M. 4985 ; I. H. 1857, 151 ; R. G. xiv. 475.) SYN. *T. Harrisi* (B. M. 4998 ; F. d. S. 1275 ; R. G. ix. 281).

T. mysorensis (Mysore). *fl.*, corolla 1½in. long, the mouth 2in. in diameter, the tube purplish, the limb yellow (in cultivation, sometimes with a red border, as in L. & P. F. G. iii. 88) ; pedicels ½in. to 1½in. long ; racemes elongated, pendent ; bracteoles 1in.

Thunbergia—*continued.*

long, falcate-elliptic, often coherent on one side, purplish-green. Spring. *l.* elliptic, acuminate, toothed, cuneate or rounded at base, 6in. long, palmately three-nerved. Branches pendent. Mysore, 1854. An extensive climber. SYN. *Hexacentris mysorensis* (B. M. 4786; F. d. S. 752, 942; L. J. F. iii. 285; R. G. 280).

T. natalensis (Natal). *fl.* horizontally drooping, large, handsome; corolla tube yellow, 2in. long, curved upwards; limb blue, large, the lobes obcordate, horizontally spreading; peduncles axillary, solitary, erect, single-flowered. July. *l.* opposite, the pairs rather approximate, sessile, ovate, acute or sub-acuminate, sinuate-serrate, glabrous above, hairy on the midrib and veins beneath. Stem erect, 2ft. or more high, shrubby below. Natal, 1857. (B. M. 5082.)

T. Vogeliana (Vogel's). *fl.* deep bluish-violet, with a yellow throat, about as large as those of *T. erecta*, but of greater substance. Summer. *l.* large, ovate or oblong, narrowed or rounded at base, dark green. Fernando Po, 1863. A handsome, erect-growing species. SYN. *Meyenia Vogeliana* (B. M. 5389).

THUNIA. Included under **Phaius** (which *see*).

THUYA (from *Thuia*, the old Greek name used by Theophrastus). Arbor-Vitæ. Sometimes spelt *Thuja*. Including *Biota*. *Chamæcyparis* is included, by Bentham and Hooker, under *Thuya*, but for garden purposes it is kept distinct in this work. ORD. *Coniferæ*. A genus comprising about a dozen species of hardy, evergreen trees or shrubs, natives of North America and extra-tropical Eastern Asia. Flowers monœcious; males terminal, solitary; female catkins ovoid or oblong, rarely globose. Leaves small, opposite, scale-like, appressed, quadrifariously imbricated, all sub-equal, or those on the flattened branchlets deeply keeled. Cones ovoid or oblong, rarely globose; mature ones rarely exceeding ½in. in length. The species are readily raised from seeds, sown in spring, under glass, and the seedlings afterwards hardened off and planted out in the open ground. Cuttings, too, of half-ripened shoots, are easily struck; these may be put in heat, under bell glasses, or kept in a cool, shaded frame. About the middle of August is perhaps the best time for propagating without heat. Some of the variegated and other dwarf-growing forms are frequently grafted on seedling stocks of the common types.

T. acuta (acute). A synonym of *T. orientalis*.

T. Doniana (Don's). A synonym of *Libocedrus Doniana*.

T. gigantea (gigantic).* White Cedar. *l.* in alternate, opposite pairs, closely imbricated; those on the branches more distant, decurrent, acute; those on the branchlets very flat, closely placed, irregularly imbricated in four rows, much shorter, more rounded, spiny-pointed. *cones* small, oval, tapering to both ends, nodding, solitary at the extremities of the smaller branchlets. Branches spreading, irregularly scattered; branchlets flattened, short, slender, flexible, undivided. *h.* 50ft. to 150ft. North-west America. A fine, graceful tree. See Fig. 28.

T. g. atrovirens (dark green). Branches spreading; branchlets open, broad, and flat. A fine, robust, very dark glossy-green variety.

T. g. erecta (erect). A much closer and more upright-growing kind than the type.

T. g. pumila (dwarf). A distinct variety, more diffuse in habit than the type, and much smaller in all its parts; the branchlets are also much closer-set, and of a brighter green.

T. g. variegata (variegated). A handsome, variegated variety, with a considerable portion of the branchlets pale yellow, distributed irregularly all over the plant.

T. gigantea (gigantic), of Carrière. A synonym of *Libocedrus decurrens*.

T. lætevirens (pleasing green). A synonym of *Thujopsis dolabrata lætevirens*.

T. occidentalis (Western).* American Arbor-Vitæ; White Cedar. *l.* very small, in opposite pairs, ovate-rhomboid, blunt-pointed, closely imbricated and flattened, thickly pressed along the branchlets in four rows; those on the older branches more distant, acute, decurrent, dull yellowish-green. *cones* obovate, ¼in. long, on short footstalks. Branches distant, horizontal, irregularly scattered along the stem; branchlets laterally spreading. *h.* 40ft. to 50ft. North America, 1596. A large bush or tree. Gordon, in "The Pinetum," enumerates the following varieties:

T. o. alba (white). Tips of the young branchlets silvery-white during spring and early summer.

T. o. argentea (silvery). Some of the branchlets in this variety are silvery-white.

Thuya—*continued.*

T. o. aurea (golden). A nice, golden, self-coloured variety, of American origin.

T. o. compacta (compact). Bagshot Park Arbor-Vitæ. A conical-shaped and very compact variety.

T. o. cristata (crested). Branchlets small, deep green, closely arranged, spreading, frequently recurved, cockscomb-shaped towards the ends of the branches.

T. o. densa (dense). *l.* regularly imbricated, ovate, compressed, glossy-green, quadrifarious. Branches short, stout, compact; branchlets horizontal, flat, fan-shaped, of a rich, glossy colour.

T. o. Elwangeriana (Elwanger's).* *l.* dimorphous, scale-like, and closely imbricated in four rows, or linear, acute, and spreading. Branches sub-erect; branchlets slender. A dwarf-growing, dense bush.

FIG. 28. THUYA GIGANTEA.

T. o. globosa (globular). A dwarf, dense, globular bush, resembling the type except in size.

T. o. gracilis (slender). Branches long and slender, drooping regularly on all sides; branchlets open, rather thinly placed, furnished with rather long, slender, bright green laterals. A distinct variety.

T. o. Hoveyi (Hovey's). *l.* ovate, bright green, closely imbricated. Branches numerous, flat. Spray strap-shaped. A round, compact bush.

T. o. pendula (pendulous). Principal branches along the main stem in a reverted position; branchlets more densely clustered or

Thuya—*continued.*

tufted towards the ends of the branches, and in a more declining position, than in the type.

T. o. variegata (variegated). Some of the branchlets in this variety are pale yellow.

T. o. Vervaeneana (Vervaene's).* Belgian Variegated Arbor-Vitæ. A pretty, gold-tinted variety, with very slender branchlets.

T. o. walthamensis (Waltham Cross).* A very fine, densely pyramidal bush, from 6ft. to 8ft. in height.

FIG. 29. BRANCHLET, WITH YOUNG CONES, OF THUYA ORIENTALIS.

T. orientalis (Eastern).* Chinese Arbor-Vitæ. *l.* on the adult plant very small, in four rows, ovate-rhomboid, acute, imbricated, adpressed, decurrent, the outer or marginal one lapping over on both sides. *cones* ovate-elliptic, solitary at the ends of the small branchlets, ½in. long, composed of six scales. Branches at first somewhat vertical and horizontal, finally fastigiate, branchlets two-rowed, densely crowded along the extremities of the branches. *h.* 18ft. to 20ft. China and Japan, 1860. A low tree or pyramidal

FIG. 30. BRANCHLET WITH ADULT CONE, OF THUYA ORIENTALIS.

bush. See Figs. 29 and 30. SYN. *T. acuta.* For general garden purposes the best name for this is *Biota orientalis.* Gordon mentions the following varieties, but regards *pendula* as a species :

T. o. argentea (silvery). This only differs from *variegata* in the white colour of a portion of its branchlets.

T. o. ascotensis (Ascot). A very nice, variegated form; a good portion of the upright branchlets are bright golden.

T. o. athrotaxoides (Athrotaxis-like). A dwarf, dense bush, with curiously-contorted branchlets.

T. o. aurea (golden). Branches short, slender, assuming during winter and spring a golden-yellow colour. A very neat, dwarf, dense bush, seldom exceeding 4ft. in height.

T. o. elegantissima (very elegant).* Tips of the young shoots golden-yellow during summer and autumn. The best of the golden-tinted varieties.

T. o. falcata (sickle-shaped). *cones* large. A very upright and pyramidal form, admirably suited for forming edges, to which purpose it is put by the Japanese.

Thuya—*continued.*

T. o. funiculata (rope-like). *l.* small, open, acute. Branchlets slender, little-divided, bright green, thinly furnished with leaves. Said to be a hybrid between the type and *T. o. pendula.*

T. o. glauca (glaucous). *l.* (as well as the branchlets) covered with a fine, glaucous powder, imparting a beautiful silvery appearance to the plant.

T. o. gracilis (slender). This differs from the type in being much slenderer, more compact and erect in all its parts, and in having much smaller and more acute leaves. Nepaul.

T. o. macrocarpa (large-fruited). Branches drooping, slender; branchlets rather distant, alternate, flattened, regularly furnished laterally with small, bright green spray. A dwarf, loose-growing form, supposed to bear somewhat larger cones than the type.

T. o. monstrosa (monstrous). *l.* thickened, ovate, obtuse, rarely acute. Branchlets few, short, gross, much contorted, often four-sided.

T. o. pekinensis (Pekin). *l.* very small, the marginal ones lapping over on both sides. *cones* small, globular, ¼in. in diameter, mostly consisting of eight scales. Branches rather long and somewhat spreading; branchlets slender. *h.* 50ft. to 60ft. Pekin, 1861. A splendid tree.

T. o. pendula (pendulous). Weeping Arbor-Vitæ. *l.* in opposite pairs, very small, rather distant, scale-like or ovate-lanceolate, loosely imbricated. *cones* globose or ovate-oblong. Branches spreading, slender, very long, recurved; branchlets thread-like, sometimes forked, loosely drooping. *h.* 10ft. to 15ft. Japan. SYN. *Biota pendula.*

T. o. pyramidalis (pyramidal). A fine variety, with a tall, narrow, fastigiate head; the leaves and branches are more robust than in the type. *h.* 20ft. to 30ft.

T. o. semper-aurescens (always golden). This desirable form resembles *T. o. aurea*, but retains its golden hue throughout the year.

T. o. Sieboldii (Siebold's). Branchlets short, numerous, bright green. Head dwarf, compact, conical.

T. o. triangularis (triangular). Branchlets arranged in a triangular manner, not flat or fan-shaped, as is usually the case.

T. o. variegata (variegated). A very effective variety, the branchlets being bright golden and green, equally intermixed all over the plant.

T. o. Zuccariniana (Zuccarini's). A nice, compact, dwarf variety, globular in form, and bright green, which colour it retains throughout the winter.

T. plicata (folded). *l.* on adult plants ovate, blunt-pointed, regularly imbricated in four rows, quite flat, smooth, bright green above, dull glaucous-green beneath; those on the young plants very much pointed. *cones* small, solitary, nodding, scattered, ovate-oblong. Branches horizontal, rather short, spreading, scattered; branchlets long, straight, linear, regularly pointed. *h.* 20ft. Nootka Sound, 1796. Tree.

T. p. minima (smallest). A compact, miniature variety. Its annual growth does not exceed 1in.

T. p. variegata (variegated). This differs from the type in having a portion of its leaves and lesser spray of a pale yellow, intermixed all over the plant in a variegated manner.

T. Standishi (Standish's). *l.* ovate, blunt-pointed, in opposite pairs, closely imbricated in four rows along the branchlets, deep glossy-green above, dull glaucous-white below. *cones* small, composed of valvate scales. Branches scattered, distantly placed, spreading; branchlets and smaller spray flat, alternate, two-edged, quite straight. Japan, 1861. Tree.

T. tatarica (Tartarian). *l.* in opposite, alternate pairs, closely imbricated in four rows, bluntly oval, somewhat flattened. *cones* similar to those of *T. occidentalis.* Branches thickly set, somewhat horizontal, rather flat, dense, compact, fan-shaped, thickly placed in two horizontal rows along the lesser spray. *h.* 8ft. to 10ft. A dense, conical bush, of garden origin. SYN. *T. Wareana.*

T. tetragona (tetragonal). A synonym of *Libocedrus tetragona.*

T. Wareana (Ware's). A synonym of *T. tatarica.*

THUYOPSIS (from *Thuya*, and *opsis*, resemblance; referring to the affinity of the genus). ORD. *Coniferæ.* A monotypic genus. The species—a tall, hardy, evergreen tree—is included, by the authors of the "Genera Plantarum," under **Thuya** (which *see* for culture).

T. dolabrata (hatchet-leaved).* *l.* in four rows, scale-like, decussate, broad, thick, ovate, rounded at the points, imbricated, furrowed along the middle, deep shining-green above, silvery-white beneath. *cones* small, ovate, sessile, squarrose, consisting of eight to ten woody scales. Branches vertical, open, pendulous at the ends; branchlets two-edged, very numerous, alternate. *h.* 40ft. to 50ft. Japan. Tree. See Fig. 31.

T. d. lætevirens (pleasing green). *l.* (as well as the branchlets) light shining green, very small. A very neat, erect, dense

Thuyopsis—*continued.*

bush, seldom exceeding from 4ft. to 5ft. in height. SYN. *Thuya lætevirens.*

T. d. variegata (variegated). This form has a portion of its lesser spray and leaves of a pale yellow colour.

FIG. 31. BRANCHLET, WITH YOUNG CONES, OF THUYOPSIS DOLABRATA.

THYANA. A synonym of **Thouinia** (which *see*).

THYLACANTHA. A synonym of **Angelonia** (which *see*).

THYLACOPTERIS. Included under *Polypodium.*

THYMBRA (the old Greek name used by Dioscorides for Savory). ORD. *Labiatæ.* A monotypic genus. The species is a hardy, suffruticose, rockwork plant, with the habit of *Thymus.* It thrives in sandy, gravelly loam, and requires the protection of a pit in winter. It may be multiplied by seeds, sown in April; or by cuttings, inserted under a handlight, in June.

T. spicata (spike-flowered). *fl.* pale purple; corolla tube exserted; whorls six to ten-flowered, in a short, dense spike or clustered head; bracts ovate or lanceolate, often coloured. June and July. *l.* linear, entire; those of the sterile branches small, obtuse, sub-decussate; those of the fertile ones nearly 1in. long, acute. Branches ascending, 6in. to 12in. long, scarcely pubescent. Mediterranean region, 1699. (S. F. G. 546.)

THYME (*Thymus*). There are two species of *Thymus* cultivated in gardens, namely Common Thyme (*T. vulgaris*) and Lemon Thyme (*T. Serpyllum vulgaris*), for the leaves and tops, which are in constant demand for culinary purposes, the aromatic flavour being generally liked. Thyme is often used as an edging for some part of the kitchen garden, a purpose for which it is admirably adapted until the plants are about three or four years old, when they require to be replaced. Propagation is easily effected by seeds, sown in April, either on a warm border, with a view to transplanting afterwards, or in drills where the plants are intended to form an edging. In either case, a space of 4in. or 6in. should be allowed between every two plants. Division is also a ready method of propagation; it should be done in March or April. The branches will also root readily into the ground, and form plants, if they are covered with a little soil; this is the best way of increasing a stock of Lemon Thyme. A light, rather dry soil, and warm situation, is most preferable for Thyme plants. A stock of branches should be cut when the plants are coming into flower, and suspended in a cool place for using in a dry state.

THYME, BASIL. *See* **Calamintha Acinos.**

THYME, CAT. A common name for *Teucrium Marum* and *T. Polium.*

THYMELÆA (from *Thymos*, Thyme, and *Elaia*, the Olive; in allusion to the Thyme-like foliage and the small, Olive-like fruit). ORD. *Thymelæaceæ.* A genus

Thymelæa—*continued.*

comprising about a score species of hardy or half-hardy, perennial or rarely annual herbs, sub-shrubs, or small shrubs, mostly inhabiting the Eastern Mediterranean region, but extending as far as the Canary Islands and Persia, a few being also found in Central Asia and Europe. Flowers small, sessile in the axils, fascicled or solitary, hermaphrodite or by abortion polygamous; perianth urceolate or rarely (especially in the male flowers) with a slender, cylindrical tube, the lobes four, spreading; stamens eight, on very short filaments; bracts small. Leaves scattered, often small or narrow. The two best-known species are here described. Both thrive in a compost of equal parts loam and peat. Propagation may be effected by cuttings. Matured shoots or side growths should be selected, in autumn, inserted thinly in well-drained pots of peaty soil, and covered with a bell glass. If kept in a cool house in winter, they will callus, and may, early in spring, be introduced to gentle heat, to encourage growth and the emission of roots. The young plants may then be potted singly, and grown on in a close, but not high, temperature, and afterwards hardened and kept quite cool during the following autumn and winter, in order to thoroughly ripen the wood.

T. hirsuta (hairy). *fl.* white; fascicles axillary or terminal, few-flowered, equalling the leaves. July. *l.* coriaceous, ovate, nearly round, or oblong, obtuse, nerveless, two to three lines long, glabrous above, white-tomentose beneath. Stems 1ft. to 2ft. long, slender, fastigiate-branched. Mediterranean region, 1759. A decumbent, greenhouse or half-hardy shrub. SYN. *Passerina hirsuta* (B. M. 1949; S. F. G. 360).

T. Tartonraira (Tartonraira). *fl.* white, copious, two to five glomerate in the upper axils; bracteoles whitish. June. *l.* coriaceous, obovate or obovate-oblong, nerved, imbricated, five to ten lines long. Branches copious, divaricate, rigid. South Europe, &c., 1640. A small, hardy shrub, wholly silky-canescent, whitish or fulvescent. SYNS. *Daphne Tartonraira, Passerina Tartonraira* (S. F. G. 354).

THYMELÆACEÆ. A natural order of trees or shrubs, very rarely slender, annual herbs, broadly dispersed. Flowers hermaphrodite, or by abortion polygamous or dicœcious, regular, capitate or shortly racemose or spicate, rarely solitary; perianth inferior, petaloid or rarely herbaceous; lobes or segments four or five, imbricated in æstivation, simple, or the two inner ones rarely rather smaller; scales equalling, or often twice or rarely thrice as many as, the lobes; stamens as many, or twice as many, as the lobes; filaments filiform, short; hypogynous disk annular, cup-shaped; ovary sessile or shortly stipitate; bracts variable. Fruit nearly always indehiscent, a nut, berry, or drupe. Leaves opposite, or often alternate or scattered, entire, sometimes numerous and small, sometimes ample; stipules absent. The order includes about thirty-eight genera and 360 species. Examples: *Daphne, Gnidia, Lagetta, Phaleria, Pimelea.*

THYME, WATER. *See* **Elodea.**

THYMUS (from *Thymos*, the old Greek name used by Theophrastus for this plant or for Savory). Thyme. ORD. *Labiatæ.* A genus of mostly hardy, small shrubs or under-shrubs, inhabiting Northern temperate regions, but mostly found in the neighbourhood of the Mediterranean. The number of species is variously estimated by different authors as between forty and eighty. Calyx ovoid, ten to thirteen-nerved, bilabiate, the upper lip three-toothed, the lower bifid; corolla tube naked within, the limb obscurely bilabiate, the upper lip straight and notched, the lower one trifid; stamens four, usually exserted; whorls often few-flowered, distant and axillary or spicate. Leaves small, entire; floral ones conformed, or changed to bracts on the spikes. The species are not possessed of much beauty. They are of simple culture in ordinary soil. Increased by divisions, by slips, by cuttings, or by seeds, sown in March or April. Other species formerly included here will be found under **Calamintha.**

Thymus—*continued.*

T. Chamædrys (Chamædrys). *fl.* light purple, sub-capitate, generally with several separate whorls beneath the terminal head. Summer and autumn. *l.* oval, elliptic-oval, or oblong-elliptical, generally rather abruptly contracted into the petiole. Stems wiry, ascending, slightly branched. Europe (Britain), &c. (Sy. En. B. 1044.)

T. C. lanuginosus (woolly). A pretty form in which the leaves and young shoots are clothed with long, woolly hairs.

T. C. montanus (mountain-loving). *l.* larger than in the species. Branchlets longer and more erect. (B. M. 2666, under name of *T. nummularius.*)

T. citriodorus (Lemon-scented). A synonym of *T. Serpyllum vulgaris.*

T. nummularius (Moneywort-like). A synonym of *T. Chamædrys montanus.*

T. Serpyllum (Serpyllum). Brotherwort; Wild Thyme. *fl.* rose-purple, ⅛in. to ¼in. long, on very short pedicels; whorls capitate; bracts leafy. June to August. *l.* green, flat, quite entire, ⅛in. to ¼in. long. Stems decumbent. Rootstock woody. Europe (Britain), &c. (Sy. En. B. 1043.)

T. S. vulgaris (common). Lemon Thyme. *l.* smaller, with very prominent veins. This is sometimes called *T. citriodorus.* *See also* **Thyme.**

T. striatus (striated). *fl.*, calyx teeth rigid, pungent; whorls closely approximating in an oblong head. *l.* sub-sessile, linear, rigid, narrowed at base, glabrous, ciliated; floral ones broadly cordate-ovate, striated, pubescent. Floriferous branches ascending. Greece. Half-hardy, procumbent shrub. SYN. *T. Zygis* (S. F. G. 574).

T. vulgaris (common). Garden Thyme. *fl.* resembling those of *T. Serpyllum*, but often smaller. June. *l.* sessile, ⅛in. to ¼in. long, linear- or ovate-lanceolate, acute, the margins revolute. *h.* 6in. South Europe, 1548. (B. M. Pl. 205.) For culture, &c., *see* **Thyme.**

T. Zygis (Zygis). A synonym of *T. striatus.*

THYRSACANTHUS (from *thyrsos*, a thyrse, and *Acanthus*; in allusion to the form of inflorescence). Thyrse Flower. SYN. *Odontonema.* ORD. *Acanthaceæ.* A genus comprising about a score species of stove, erect herbs or shrubs, natives of tropical America. Flowers red, fascicled in the axils of the bracts, pedicellate; calyx short, somewhat five-parted; corolla tube elongated; limb sub-bilabiate, four-cleft; stamens two, affixed above the middle of the tube; fascicles or cymes disposed in a thyrse. Leaves opposite, entire, often large. The species known to cultivation are described below. They thrive in a compost of about equal parts of loam and leaf soil. Propagated by cuttings, inserted, preferably in single pots, in spring, and placed in a close, warm frame. Young plants should be pinched, to encourage a bushy growth. Some of them may be cultivated in frames during the summer, but require a stove temperature in winter.

T. barlerioides (Barleria-like). *fl.*, corolla 1in. to 1½in. long, glabrous, the lobes ovate, obtuse; thyrse sub-sessile, composed of approximate whorls, 2in. to 7in. long, many-flowered, dense, interrupted at base; bracts ¼in. long, subulate-acuminate. *l.* 6in. to 9in. long, 1¾in. to 3in. broad, sessile, shortly attenuated at apex, argutely acuminate, terminal. Stem erect, succulent. Minas Geraes. A pubescent perennial. (F. d. S. 986.)

T. bracteolatus (bracteolate).* *fl.*, corolla ½in. long, pubescent-viscidulous, the upper lip bifid; thyrse pubescent, terminal, narrow; bracts lanceolate-subulate; bracteoles subulate; lower peduncles three or many-flowered, upper ones one-flowered. July and August. *l.* oblong-lanceolate, long-acuminate, shortly petiolate, glabrous, shining, subulate, 4in. to 6in. long, 1in. to 2in. broad. Branches acutely tetragonal. *h.* 2ft. New Grenada, 1823. Shrub. (B. M. 4441.)

T. callistachyus (beautiful-spiked).* *fl.*, sepals pubescent, bristly-acuminate; corolla glabrous, the segments glandular within; upper lip bilobed, the lower one much deflexed; inflorescence straight, naked, the axis tomentose. July and August. *l.* oblong, petiolate, wrinkled, acute, below (as well as the branches) tomentose. Mexico. *h.* 2ft. Shrub. (L. J. F. 165; L. & P. F. G. ii. 53; R. G. 1054.) SYNS. *T. lilacinus, Justicia lilacina* (of gardens).

T. indicus (Indian). *fl.*, calyx deeply five-cleft, the segments erect; corolla white, with a few purple lines, funnel-shaped, the mouth oblique, the limb obscurely bilabiate, the segments spreading-reflexed; thyrse terminal. April. *l.* opposite, about 3in. long, oblong-lanceolate, pinnate-veined, acuminate, entire, dark green, gradually tapering at base into a short petiole. Stem and branches tetragonal. *h.* 2ft. Bhotan, 1857. Shrub. (B. M. 5062.) The correct name of this plant is *Asystasia bengalensis.*

Thyrsacanthus—*continued.*

T. Lemaireanus (Lemaire's). A synonym of *T. strictus.*

T. lilacinus (Lilac-flowered). A synonym of *T. callistachyus.*

T. nitidus (shining). *fl.*, corolla ½in. long, slightly bilabiate; lobes drooping, sub-equal, oblong, rather blunt, about as long as the tube; fascicles somewhat distant; raceme compound at the base. *l.* oblong or lanceolate-oblong, acuminate, 3in. to 8in. long, tapering into the short petioles. *h.* 3ft. to 4ft. West Indies. Shrub. SYN. *Justicia nitida* (A. B. R. 570).

T. rutilans (reddish).* *fl.* solitary in the axils of the bracts; corolla tubular-ventricose, the lobes sub-equal, erose; raceme terminal, axillary, 8in. to 10in. long, twelve to sixteen-flowered, nodding. Winter and spring. *l.* sessile, oblong-lanceolate, acuminate, acute, narrowed at base, obsoletely erose denticulate on the margins, paler beneath, sparsely pilose on both sides. *h.* 2ft. Columbia, 1851. Shrub.

T. rutilans (reddish), of gardens. A synonym of *T. Schomburgkianus.*

T. Schomburgkianus (Schomburgk's).* *fl.* brilliant crimson, distant, opposite; corolla 1in. long, with a nearly regular limb, the segments ovate, scarcely spreading; raceme terminal, elongated, long-pedunculate, glandular-pubescent. Winter and spring. *l.* oval-oblong, cuspidate-acuminate, 8in. to 12in. long. Branches sub-tetragonal, with smooth angles. *h.* 3ft. New Grenada, 1855. Shrub. (B. M. 4851.) SYN. *T. rutilans* (B. H. 1865, p. 97; F. d. S. 732; L. & P. F. G. iii. p. 73).

T. strictus (straight). *fl.* all fascicled; corolla nearly 1in. long, with an oblique, nearly regular limb, the segments oblong, acute; whorls approximate, adpressed; thyrse terminal, elongated, straight, simple, narrow, 1ft. long; bracts subulate, nearly equalling the pedicels. February and March. *l.* oblong, acuminate, acute at base, shortly attenuated into the petioles. Stem simple, elongated. *h.* 3ft. Honduras, 1840. A glabrous shrub. (B. M. 4378.) SYNS. *T. Lemaireanus, Aphelandra longiscapa* (of gardens), *Eranthemum coccineum* (F. d. S. 240), *Justicia longiracemosa* (of gardens), *Salpingantha coccinea* (of gardens).

THYRSANTHUS. A synonym of **Wistaria** (which *see*).

THYRSE. A panicle whose principal diameter is midway between the base and apex.

THYRSE FLOWER. *See* **Thyrsacanthus.**

THYRSOID. Resembling a thyrse.

THYRSOPTERIS (from *thyrsos*, a bunch or raceme, and *Pteris*, a Fern; the fructification is disposed in racemose bunches). ORD. *Filices.* A monotypic genus. The species is a handsome, but very rare, greenhouse Fern. For general culture, *see* **Ferns.**

FIG. 32. PORTION OF FERTILE FROND OF THYRSOPTERIS ELEGANS.

T. elegans (elegant). *cau.* arborescent. *fronds* decompound, attaining a length of 5ft. to 6ft., one-third of which is naked; sterile portions bipinnate, with lanceolate, incised pinnules; fertile parts tripinnate, each pinna becoming a raceme of stalked involucres. *sori* globose; involucre cup-shaped. *h.* 15ft. Juan Fernandez, 1854 See Fig. 32.

THYRSULA. The little cyme borne by the majority of the *Labiatæ* in the axils of their leaves.

THYSANOTUS (from *thysanotos*, fringed; alluding to the three elegantly-fringed inner perianth segments). Fringed Violet; Fringe Lily. SYN. *Chlamysporum.* Including *Isandra.* ORD. *Liliaceæ.* A genus including nineteen species of greenhouse perennials, all Australian, one extending to the Philippine Islands and South China. Flowers umbellate, rarely solitary; perianth marcescent, persistent, of six segments, the outer ones narrow, the inner ones with broad, coloured margins,

Thysanotus—*continued.*

and fringed on the edges; stamens six, or sometimes three; bracts short, imbricated; scapes leafless or nearly so, simple or variously branched. Leaves radical, grass-like. The following species have been introduced, and are very elegant subjects when in flower. They thrive in sandy loam, and may be increased by offsets.

T. dichotomus (dichotomously branched). *fl.* one, two, or rarely three, in terminal umbels; perianth segments purple; stamens six. July. *l.*, radical ones few, short, withering early. Stems very variable, sometimes erect, branched, 1ft. to 2ft. high, rarely almost twining. Rhizome thick, fibrous. 1838. (B. R. 1840, 14, under name of *T. intricatus.*) *T. tenuis* is probably a reduced form of this species. (B. R. 1838, 50.)

T. elatior (tall). A form of *T. tuberosus.*

T. intricatus (intricate). A synonym of *T. dichotomus.*

T. isantherus (even-anthered). A synonym of *T. tuberosus*

T. junceus (Rush-like).* *fl.* one to three in terminal umbels, and sometimes one or two sessile along the lower branches; perianth segments purple, five to six lines long; stamens six. August. *l.*, radical ones few, narrow-linear, short, soon withering. Stems slender, loosely branched, erect or flexuous, 1ft. to 2ft. high, bearing sometimes a short leaf near the base. Rhizome thick, fibrous. 1804. (B. M. 2351; B. R. 656.)

T. multiflorus (many-flowered). *fl.*, perianth segments purple, the outer ones very acute, the inner ones rather shorter; stamens three; scapes simple, 6in. to 18in. high, bearing a single, terminal, many-flowered umbel or rarely a second one lower down. August. *l.* all radical, densely tufted, erect, rigid, much shorter than the scape. Stock densely tufted, with fibrous roots.

T. m. prolifer (proliferous). A luxuriant form, having a large, terminal umbel, frequently a second one rather lower down, and leaves sometimes exceeding the scape. (B. R. 1833, 8, and F. d. S. 1911, under name of *T. proliferus.*)

T. proliferus (proliferous). A synonym of *T. multiflorus prolifer.*

T. tenuis. *See* **T. dichotomus.**

T. tuberosus (tuberous-rooted).* *fl.*, perianth purple, sometimes six to seven lines long; stamens six; scape erect, rigid, terete, 6in. to over 12in. high, branching into a loose, irregularly dichotomous panicle, each branch having a terminal umbel of one to four flowers, and sometimes a lateral, sessile one. June. *l.* radical, not numerous, narrow-linear, very short or as long as the scape. Fibrous roots swollen into tubers. 1825. (B. R. 655, under name of *T. isantherus.*) *T. elatior* is a tall, strong, many-flowered form of this species.

FIG. 33. TIARELLA CORDIFOLIA, showing Habit and detached Flower.

TIARELLA (from *tiara*, a Persian diadem; alluding to the shape of the capsules). ORD. *Saxifrageæ.* A genus including five species of hardy, erect, slender, perennial herbs; one is a native of the Himalayas, and the rest are North American. Flowers white, on slender pedicels; calyx tube short, the limb five-lobed; petals five, entire; stamens ten, the filaments elongated;

Tiarella—*continued.*

racemes terminal. Leaves mostly radical, long stalked, simple or trifoliolate; stipules small, adnate with the petioles. *T. cordifolia* is the best-known species. It thrives in ordinary soil, and is well suited for rockwork, or for the front of the flower border. Increased by divisions.

T. cordifolia (heart-shape-leaved).* False Mitrewort. *fl.* white; petals oblong, clawed; raceme simple; scapes 6in. to 12in. high. April. *l.* cordate, acutely lobed, unequally mucronate-toothed, hirsute above, pubescent beneath. Stem thick, sending out creeping stolons after flowering. North America, 1731. See Fig. 33. (B. M. 1589.)

T. Menziesii (Menzies'). A synonym of *Tolmiea Menziesii.*

TIARIDIUM. Included under *Heliotropium.*

TIBOUCHINA. Included under *Pleroma.*

TICKLE MY FANCY. *See* **Viola tricolor.**

TICKS. These belong to the same group as Mites, viz., the *Acarida*, and are not insects, in the strict sense, at all. They are fairly numerous, and have been placed under several genera, included in the family *Ixodidæ*, which takes its name from the chief genus, *Ixodes.* To this genus almost all the British Ticks belong. They all live in woods and thickets, or upon low herbage, apparently feeding, for a time at least, on the juices of plants; but all Ticks seek to attach themselves to the bodies of passing animals; and, once attached, they bury their proboscis in the animal's skin, and live there for the rest of their lives, unless dislodged, sucking blood, and growing rapidly. It has been supposed that each species is parasitic upon a single species of animal; but though each usually shows a preference for some one species of host, they are able to subsist on others also, and all animals, from man downwards, are liable to their attacks. Dogs are peculiarly troubled with them; and in Britain, the one known as the Dog-tick (*I. erinaceus*) is common on dogs, cattle, &c.

In general appearance, Ticks are much alike, all being covered by a tough skin, with no division into segments. They are usually ovate or elliptical in form; each of their eight legs ends in a sucker and two claws, giving a firm grasp; and the head bears a barbed snout, which, once buried under the skin, cannot be withdrawn. The palpi, or feelers, at the sides of the mouth, contain two tubes for sucking in the fluid food. Some Ticks have eyes, others have none. Each bears a small, horny shield on the back, behind the head. The largest species, when full of blood, may become as large as a common bean; but few reach this size.

Ticks sometimes cause much annoyance to gardeners in autumn, by fixing themselves to the skin, in the manner described above. They can be got rid of by washing the affected parts with an infusion of tobacco, which stupefies them, and weakens their hold on the skin, so that they can be readily removed. If Ticks are carelessly pulled off, the head and fore limbs are often left in the wound, and are apt to cause annoying sores, if not removed at once.

TICOREA (the name of *T. fœtida* in Guiana). SYNS. *Ozophyllum, Sciuris.* ORD. *Rutaceæ.* A genus embracing about half-a-score species of stove trees or shrubs, natives of Brazil and Guiana. Flowers white, yellowish-white, or scarlet, on bracteate pedicels; calyx short, four or five-lobed; corolla tubular-infundibular, the tube elongated, the limb of five valvate lobes; disk cup-like or urceolate; stamens five to eight; panicles or cymes terminating the branchlets, rarely axillary, leafless. Leaves opposite or alternate, simple or consisting of one to three entire, pellucid-dotted leaflets. Two species have been introduced. They thrive in a compost of peat, loam, and sand. Propagation may be effected by ripened cuttings, inserted in sand, under a glass, in heat.

Ticorea—*continued.*

T. fœtida (fœtid). *fl.* white, six or seven in a corymb, sessile along the branches; petals six times longer than the calyx. February. *l.* consisting of three equal, almost sessile leaflets, which, when bruised, emit a disagreeable smell. *h.* 10ft. Guiana, 1825. Shrub. (A. G. 277.)

T. jasminiflora (Jasmine-flowered). *fl.* white, sessile along the branches of the rather loose panicle. September. *l.* consisting of three lanceolate, acuminate, tapering leaflets. *h.* 20ft. Brazil, 1827. Tree.

TIGAREA. A synonym of **Purshia** (which *see*).

TIGER IRIS. *See* **Tigridia.**

TIGER LILY. *See* **Lilium tigrinum.**

TIGER MOTHS. A name commonly applied to several moths of the tribe *Bombycina* (*see* **Moths**), probably on account of the bright, variegated colours of its more conspicuous members. The larvæ of all the Tiger Moths are rather thick-bodied, and are closely covered with long, stiff hairs, usually brown or black, rising from numerous prominent warts along the back and sides. They feed on low plants, chiefly herbs, and seldom do much harm in gardens, as they prefer Dock, Plantains, and other weeds, rather than cultivated plants. In autumn, and again in spring, the larvæ of the Common Tiger, and of the Ruby Tiger, are to be seen on every road, crawling in search of food or of safe retreats for the winter, or for pupation. When full grown, in spring or early summer, they spin slight cocoons on the food-plants, or among dead leaves and surface rubbish, and in them become pupæ, from which the moths emerge in two or three weeks. The species of most common occurrence in gardens are the two just mentioned.

The common Tiger (*Arctia caja*) varies in size from 2in. to 3in. across the fore wings, which are brown, with irregularly branching, pale cream-coloured lines and spots. The hind wings are red, with six or seven blue-black spots, of which three lie in a band parallel to the hind margin. The head is brown, with a crimson collar; the thorax is brown; and the abdomen is crimson, with a series of oblong, black spots down the middle, and a row of black dots along each side. This species is very apt to vary in the colour of the wings; in some the dark tints prevail, in others the pale. The larva of this Moth is known generally as the "Woolly Bear," from its dense coat of long hairs. The latter, on the back, are dark near their bases, grey near the tips; along the sides and near the head they are brown. The larvæ hybernate while small, and feed up in spring, when they subsist on a great variety of plants in gardens. The moths usually emerge about July.

The Cream-spotted Tiger Moth (*Arctia villica*) is a little like *A. caja*, but smaller, as it does not exceed 2½in. in spread of fore wings. This species is black, with

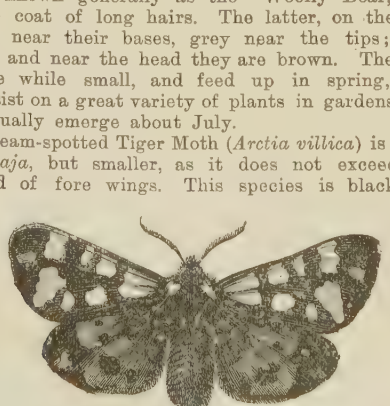

FIG. 34. CREAM-SPOTTED TIGER MOTH.

eight cream-coloured spots (see Fig. 34). The hind wings are orange-yellow, with a few small, central, black spots, and an irregular, black band along the hind margin. The larva is a good deal like the "Woolly Bear," and, like it, feeds on various herbs.

The "Wood Tiger" (*Nemeophila Plantaginis*) seldom exceeds 1½in. across the fore wings. These are black, with pale spots, passing into yellow at the margins.

Tiger Moths—*continued.*

The hind wings are dull, deep yellow or orange, with velvety-black markings, in the form of black spots, along the hind margin, and at the base. The larva is hairy; the hairs near the end of the body are black, those in the middle of the body are red-brown. It feeds on low weeds, and is scarcely ever seen in gardens, as this moth frequents moors.

The Scarlet Tiger (*Callimorpha Dominula*) is confined to localities where the Hound's-tongue (*Cynoglossum*) grows. It reaches about 2¼in. across the fore wings, which are dark olive-brown, with a metallic-green lustre, and bear about ten spots, those in the centre yellow or orange, the others cream-coloured. The hind wings are crimson, with large, black spots near the margins.

The Ruby Tiger (*Phragmatobia fuliginosa*) differs from all the above alike in size (about 1⅓in. across the front wings) and in colour. The fore wings are dull red-brown, with two black dots near the middle. The hind wings are dull pink near the base, smoky-brown near the margin, and have two dark dots near the middle; the fringes are pink. The head and thorax are brown; the abdomen is pink, with one central and two lateral rows of dark spots. The larvæ are yellowish-brown, smoke-coloured, or dark, and very hairy. They are often to be seen in autumn, seeking secure retreats for the winter, and in spring they emerge from their retreats to feed up. In April or May they spin loose, oval cocoons among herbage, and become dark pupæ; from these the moths emerge in June. The larvæ feed chiefly on low weeds, but may at times live on garden produce.

All the Tiger Moths have thick, heavy bodies. They fly at all hours by day, and also by night.

Should the larvæ ever become too numerous, hand-picking is the best remedy.

TIGLIUM. Included under *Croton.*

TIGRIDIA (from *tigris*, a tiger, and *eidos*, like; in reference to the spotted flowers). Mexican Tiger Flower; Tiger Iris. SYNS. *Beatonia*, *Hydrotœnia*. ORD. *Irideæ*. This genus includes about seven species of greenhouse or half-hardy, bulbous plants, from Mexico, Central America, Peru, and Chili. Flowers few in a spathe, in one species (*T. pavonia*) very large; perianth concave, with no tube; segments free, the outer ones very broad, unguiculate, the inner ones much smaller and erecto-patent, often obtuse, more or less undulated; filaments connate in a cylindrical tube; spathe one, terminal, or two at the axils of the floral leaves, long and unequally pedunculate. Leaves at base of stem few, narrow, or broader and plicate-veined; cauline or floral ones often two or three, scattered. *T. pavonia* and its varieties are very handsome subjects when in flower. All the species thrive best in a light, sandy soil; if planted outside, a warm, sunny position, with south aspect, should be accorded them. The roots must be lifted in the autumn, when the leaves have died down, stored away in some place where frost cannot reach them, and re-planted in the following April. Propagation may be effected either by seeds or by offsets.

T. atrata (dark).* *fl.*, perianth dark purple; outer segments with pale green-spotted claws and a dark brown lamina; spathe two-valved, 2½in. long. April. *l.* plicate, 1ft. to 1½ft. long. Stem 2ft. high. South Mexico, 1843. Greenhouse.

T. conchiflora (shell-flowered). A synonym of *T. pavonia conchiflora.*

T. curvata (curved). *fl.*, perianth yellowish, spotted with purple; peduncles curved; spathe one-valved. April. *l.* plicate, 8in. long. Stem slender, 1ft. high. Real Del Monte, 1843. Greenhouse.

T. lutea (yellow). *fl.* pedicellate, fragrant; perianth yellow obscurely dotted, the outer segments obovate, 1in. long, obscurely crenate on the margins, the inner ones exappendiculate; spathe terminal, five or six-flowered, bivalved. June. *l.* ensiform, amplexicaul, very long-acuminate. Stem terete, glabrous, arching, 8in. to 10in. long. Peru, 1843. Half-hardy. (B. M. 6295.)

Tigridia—*continued.*

FIG. 35. INFLORESCENCE OF TIGRIDIA MELEAGRIS.

T. Meleagris (Meleagris).* *fl.* in colour and form resembling *Fritillaria pyrenaica*, four or five in a leafy, convolute spathe 2½in. long; segments marked with a few broken bands of crimson, slightly unguiculate. Spring. *l.* solitary, straight-veined, plaited. Stem about 1½ft. high. Mexico. Greenhouse. See Fig. 35. SYN. *Hydrotœnia Meleagris* (B. R. xxviii. 39).

T. pavonia (peacock-spotted).* Flower of Tigris; Peacock Tiger Flower. *fl.* on elongated pedicels; perianth golden-orange, the outer segments broadly ovate, 3in. long, mucronate at apex, the inner ones 1½in. long, concave-channelled below the middle; spathe three-flowered, 4in. long. June. *l.* lanceolate-ensiform, plicate, acute; radical ones distichous, 10in. to 18in. long, sheathing at base. Stem cylindrical, dichotomous, leafy, 1ft. to 2ft. high. Mexico, 1796. Half-hardy. SYNS. *Ferraria Pavonia* (A. B. R. 178; L. B. C. 1424), *F. Tigridia* (B. M. 532).

T. p. albiflora (white-flowered).* In this variety, the ground-colour of the perianth is a beautiful white.

T. p. conchiflora (shell-flowered). A rather dark yellow-flowered form. SYN. *T. conchiflora* (F. d. S. 908, fig. 2; S. B. F. G. 128).

T. p. speciosa (showy). In this form, the ground-colour is deeper and brighter than in the type. (F. d. S. 908, fig. 1.)

T. Van Houttei (Van Houtte's).* *fl.* issuing from spathes which terminate the branches of the stem; perianth about 1½in. across, the outer and larger segments yellow, with a broad basal blotch and marginal veins of purple, the inner segments lilac, veined with purple. Spring. *l.* few, ensiform, plaited; upper ones shorter. *h.* about 1ft. South Mexico, 1875. Greenhouse. (F. d. S. 2174.)

T. violacea (violet). *fl.*, perianth violet, campanulate, nodding, the blade of outer segments rose-purple, the claw white, dotted with rose-purple, ¾in. long; inner segments deflexed, white, dotted in the middle; spathe three or four-flowered, two-valved. May. *l.* ensiform, plicate-nerved; radical ones 8in. to 14in. long. Stem terete, erect, 7in. to 14in. high, dichotomous at apex. South Mexico, 1838. Greenhouse. SYN. *Beatonia purpurea.*

TIGRIS, FLOWER OF. An old name for *Tigridia Pavonia.*

TILE-ROOT. *See* **Geissorhiza.**

TILESIA. A synonym of **Wulffia** (which *see*).

TILIA (the old Latin name for the Lime, used by Virgil and Pliny). Lime-tree; Linden. ORD. *Tiliaceæ.* This genus includes about eight species of ornamental, lofty-growing, hardy, stellate- or simply-pubescent trees, inhabiting the temperate regions of the Northern hemisphere. Flowers white or yellowish; sepals five; petals five, naked or furnished with petaloid scales on the inside; stamens numerous, free or irregularly disposed in bundles; bract of the peduncle leaf-like, adnate for half its length; cymes axillary or terminal. Fruit globose, nut-like, indehiscent, one or two-seeded. Leaves often obliquely cordate, serrated. Several species are grown in this country, one being a native. The flowers contain a quantity of honey, and are consequently haunted by bees. Russian Bass or Bast Mats, so well known to gardeners, are prepared from the inner bark of various species. The smooth, light, delicately-white, and uniform wood of *T. platyphyllos* and *T. vulgaris* is in great demand by carvers, turners, and musical instrument makers.

Culture, &c. A good, loamy soil is suited to the requirements of Limes. In dry situations, the species never attain a large size, and they lose their leaves earlier than any other tree. Being a tree of the plains, rather than of the mountains, the Lime does not appear suitable for very exposed situations. Propagation is usually effected by layers, which are made in the nurseries, in autumn and winter, and become rooted, so as to admit of being taken off, in a year. Seeds are seldom ripened in this country; when obtainable, they should be sown immediately after being gathered, but the raising of plants by this means is an exceedingly slow process. Du Hamel states that "the French gardeners, when they want a supply of young Lime-trees, cut over an old one close by the surface of the ground, which soon sends up a great number of shoots: among these they throw in a quantity of soil, which they allow to remain one, two, or three years; after which they find the shoots well rooted, and of a sufficient height and strength to be planted at once where they are finally to remain." This mode is still practised in France and Belgium, both with the Lime and the Elm. The Lime-tree bears transplanting when of a considerable size; but when grown for this purpose, it should be taken up and replanted every two or three years. Trees that have stood some years without being removed should have the roots cut round, at from 3ft. to 4ft. from the stem, a year before transplanting, in order to stunt the growth, both of the head and roots, and to induce the production of smaller roots and fibres. The different cut-leaved and variegated forms are usually increased by grafting on strong plants of any of the common species.

Insects, &c. Of foes to the Lime-tree, only a few do so much injury as to call for detailed notice here. The bark and wood are liable to attacks by Beetles, though healthy trees seldom suffer thereby. The caterpillars of several kinds of Moths, most of them small, frequently disfigure the leaves by drawing them together by webs, or rolling them to form tubes, and by eating large holes in them. The more destructive species belong to the Winter Moths, the females of which either have no visible wings, or have them so small as to be useless (*see* **Hybernia** and **Winter Moth**). Their ravages may be lessened by shaking the branches, and collecting the caterpillars when they drop from their tubes; or, yet more effectually, by interposing an obstacle, *e.g.*, a belt of tar, in autumn and winter, round the foot of the tree, to prevent the ascent of the female moth to lay her eggs.

Lime-trees are very liable to be injured by the growth of galls on the younger parts. A Gall-midge (*Cecidomyia floricola*) often makes galls on the branches or leaf-stalks, in the form of swellings about the size and form of a small pea, in the centre of which the larvæ may

Tilia—*continued.*

be found. The leaves are very liable to be galled by Mites of the genus *Phytoptus*. These Mites are extremely small, requiring a considerable magnifying power to show them; but the genus is easily recognised by having only four legs, instead of eight, as in other Mites, and by being gall-makers—a mode of life not shared by other Mites. The Mites do not in themselves afford characters by which the species can be clearly distinguished from one another; but the galls made by them are very constant in form and aspect, so that they can be readily recognised. On Lime leaves there may be found three at least, very distinct from one another. The first resembles small nails, and has received the popular name of Nail-galls. It has also received the name of *Ceratoneon extensum*. Frequently, many of these galls stand on almost every leaf of the tree. Another gall is in the form of small, round, hard warts, at the origin of the larger leaf-veins; while the third forms velvety patches, ¼in. to ¾in. across, on the lower surface of the leaves, so much resembling a Fungus that it was at one time described as such under the name *Erineum tiliaceum*. It consists of a patch of hairs, between which the Mites live. The hairs are at first white, but show a tendency to become brown.

Except where very numerous, these galls can hardly be regarded as doing much harm to the trees. The most likely method of limiting their attacks is to remove the affected leaves or branches, and to destroy them, as soon as possible after the first appearance of any of the galls on a plant.

T. alba (white). A synonym of *T. argentea*.

T. a. pendula (white weeping). A synonym of *T. petiolaris*.

T. americana (American). American Basswood or Whitewood. *fl.* yellowish-white; petals truncate and crenate at apex, equalling the style, furnished with scales. July and August. *fr.* yellow, the size of a large pea. *l.* deeply cordate, abruptly acuminate, sharply serrated, somewhat coriaceous, glabrous, turning yellowish-brown in decay. *h.* 60ft. to 70ft. North America, 1752.

T. a. pendula (weeping). A garden synonym of *T. petiolaris*.

T. a. pubescens (downy). *fl.* pale yellow. June. *l.* 3in. to 4in. in diameter, the under surface, when young, rather paler than the upper, but at length nearly the same colour; serratures broad and short. *h.* 50ft. to 70ft. 1726.

T. argentea (silvery).* White or Silver Lime. *fl.* yellowish-white, very fragrant; petals each with a scale on the inside. June to August. *fr.* yellow, evidently ribbed. *l.* cordate, somewhat acuminate, rather unequal at base, serrated, smooth above, white-downy beneath, four times the length of the petioles. *h.* 30ft. to 50ft. Eastern Europe, 1767. (W. D. B. 71, under name of *T. alba*.)

T. a. pendula (weeping). A synonym of *T. petiolaris*.

T. cordata (heart-shaped). *fl.* yellowish-white; petals without a scale at their base. Summer. *fr.* crustaceous-pubescent, globose or ellipsoid, faintly-ribbed. *l.* glabrous, glaucous, and pubescent, in the axils of the nerves beneath. Europe and Siberia. A small tree, generally with leaves smaller in size than those of either *T. platyphyllos* or *T. vulgaris*. This is the last of the three to flower. It is found here and there in woods in Britain, and is regarded by some authorities as a truly indigenous species. SYNS. *T. microphylla*, *T. parvifolia* (Sy. En. B. 287), *T. ulmifolia*.

T. dasystyla (thick-styled).* *fl.*, lower part of the pyramidal style tomentose and persistent as a point. Summer. *l.* large, obliquely truncate at base or sometimes sub-cordate, slightly hairy beneath and bearded in the axils of the nerves. Buds glabrous. *h.* 30ft. to 60ft. South Tauria, 1884.

T. europæa. *See* **T. platyphyllos** and **T. vulgaris.**

T. e. laciniata (torn). A synonym of *T. platyphyllos asplenifolia*.

T. grandifolia (large-leaved). A synonym of *T. platyphyllos*.

T. heterophylla (variable-leaved). American White Basswood. *fl.* greenish-yellow, few in a loose cyme; petals obtuse, crenulated. July and August. *l.* 4in. to 8in. in diameter, very oblique, more or less cordate, abruptly acuminate, green and somewhat shining above, very white and velvety-tomentose and conspicuously veined beneath. *h.* 30ft. to 50ft. North America, 1811.

T. intermedia (intermediate). A synonym of *T. vulgaris*.

T. microphylla (small-leaved). A synonym of *T. cordata*.

T. parvifolia (small-leaved). A synonym of *T. cordata*.

T. petiolaris (petiolate).* *fl.* yellow-green, with five petaloid scales inserted amongst the stamens. July. *fr.* depressed, globose, five-lobed, warted, ½in. in diameter. *l.* pale green above, white, hoary-pubescent beneath; petiole as long as, or longer than, the blade. Branchlets pendulous, leafy. Trunk erect. *h.* 50ft. Crimea (?). This greatly resembles the White Lime, but is easily recognised by its much longer leafstalks and its warted fruits. (B. M. 6737.) SYNS. *T. alba pendula*, *T. americana pendula* (of gardens), *T. argentea pendula*.

T. platyphyllos (broad-leaved).* *fl.* yellowish-white; petals without a scale at their base. June. *fr.* obovate, globose, with from three to five prominent ribs when ripe. *l.* downy sometimes on both surfaces, always on the entire under surface. *h.* 70ft. to 90ft. Europe (Britain). This species is the earliest to flower. SYNS. *T. europæa* (in part), *T. grandifolia* (Sy. En. B. 285).

T. p. asplenifolia (Spleenwort-leaved). This has curiously laciniated leaves and is not so vigorous or tall a grower as the type. SYN. *T. europæa laciniata*.

T. p. aurantia (orange). In this form, the bark of the young twigs is of an orange-yellow colour.

T. p. Blechiana (Blech's). *l.* very large. A distinct and vigorous form of garden origin.

T. p. pyramidalis (pyramidal). A form of distinctly pyramidal habit.

T. p. vitifolia (Vine-leaved).* A pretty variety, with lobed, Vine-like leaves. SYN. *T. vitifolia*.

T. ulmifolia (Elm-leaved). A synonym of *T. cordata*.

T. vitifolia (Vine-leaved). A synonym of *T. pyramidalis vitifolia*.

FIG. 36. BRANCHLET, AND DETACHED CLUSTER OF FRUITS, OF TILIA VULGARIS.

T. vulgaris (common).* Lime, Lin, Linden, or Line-tree. *fl.* yellowish-white; petals without a scale at their base. Summer. *fr.* woody, pubescent, not ribbed when ripe. *l.* glabrous above, pubescent in the axils of the veins beneath. Europe, Caucasus (naturalised in Britain). This species begins to flower when *T. platyphyllos* is nearly past. See Fig. 36. SYNS. *T. europæa* (in part), *T. intermedia* (Sy. En. B. 286).

T. v. variegata (variegated). This only differs from the type in having the leaves blotched with dull creamy-white. SYN. *T. europæa variegata*.

TILIACEÆ. A natural order of trees, shrubs, or rarely herbs, broadly dispersed, numerous in the tropics. Flowers regular, hermaphrodite or rarely unisexual,

Tiliaceæ—*continued.*

axillary or terminal, often cymulose; sepals five, rarely three or four, free or connate, often valvate; petals as many or fewer, or none, alternating with the sepals, inserted around the base of the torus, entire or incised; æstivation contorted or variously imbricated, induplicate, or valvate; stamens usually indefinite; filaments free, or connate in a ring of five to ten bundles; anthers two-celled; ovary free, sessile. Fruit two to ten-celled, or, by abortion, one-celled, variable. Leaves alternate, in a few species opposite or nearly so, simple, penninerved or palminerved, entire, toothed, or rarely lobed; stipules twin, usually small and deciduous, rarely larger and persistent or absent. Several of the species in this order furnish materials for making cord. Jute, the fibre of *Corchorus capsularis*, has, of late, become the rival of hemp in the English market, many thousands of tons being annually imported from India. The order comprises about 46 genera and 330 species. Examples: *Aristotelia, Corchorus, Prockia, Tilia, Triumfetta.*

TILIACORA (the Bengalese name). Syn. *Braunea* (in part). Ord. *Menispermaceæ*. A monotypic genus. The species is a stove, evergreen, climbing shrub, thriving in a compost of sandy loam and peat. Cuttings will root readily in sand, under a glass, in heat.

T. racemosa (racemose-flowered). *fl.* yellow; panicles axillary, 6in. to 12in. long, hoary, at length glabrous; branches 1in. long, the males three to seven-flowered, the females simple and one-flowered. May. *fr.*, drupe ½in. long, obovoid, stalked, sub-compressed, red. *l.* 3in. to 6in. long, ovate, acuminate, glabrous, acute, truncate, rounded, or sub-cordate at base, thin, the margins undulated; petioles ½in. to 1in. long. East Indies, 1820.

TILL. Another name for Lentil.

TILLÆA (named in honour of M. A. Tilli, 1653-1740, an Italian botanist). Including *Bulliarda*. Ord. *Crassulaceæ*. A genus comprising about twenty species of aquatic or terrestrial, cosmopolitan herbs. Flowers white or reddish, minute, variously disposed. Leaves opposite, cylindrical, subulate, or flat, entire. *T. muscosa* (Mossy Redshanks) is a British plant. Several exotic species have been introduced, but their interest is of a botanical character only.

TILLANDSIA (named in honour of Elias Tillands, a Swedish botanist, and Professor of Medicine in the University of Abo). Syn. *Renealmia* (of Linnæus). Including *Allardtia, Anoplophytum, Bonapartea, Phytarrhiza, Platystachya, Vriesia, Wallisia* (of Regel). Ord. *Bromeliaceæ*. A large genus (according to the authors of the "Genera Plantarum," nearly 120 species) of very handsome, stove, epiphytal or rock-loving, very rarely terrestrial, glabrous or often more or less furfuraceous herbs, natives of tropical America, a few extending into North America. Flowers solitary in the bracts; sepals erect, rather rigid, free, closely imbricated; petals free, deciduous, the erect claws connivent in a tube, the blades spreading; stamens free; filaments filiform; anthers oblong-linear, erect, shorter than the petals, or sometimes exserted; bracts variable; spike terminal, simple or compound, rarely reduced to a one-flowered peduncle. Capsules oblong or linear, septicidally three-valved. Leaves narrow, entire. Most of the plants of this genus are epiphytal on trees under natural conditions; but under cultivation it is found best to treat the majority of them as pot-plants, the exceptions being such as *T. bulbosa, T. Gardneri, T. ixioides*, and *T. usneoides* (Old Man's Beard)—which last could not well be grown in a pot, and, as it makes no roots, does not require soil. These should be fastened on to blocks of cork or soft wood, and a little sphagnum placed about them to root in. Grown in pots, the strongest kinds, *e.g., T. corallina, T. Itatiaiæ*, the gigantic *T. regina*, and *T. splendens*, require a strong soil, such as fibrous loam with rotted manure added, or loam, peat, and manure. *T. Lindeni* and the whole of the *Vriesia*

Tillandsia—*continued.*

section thrive best in a mixture of loam, peat, and leaf mould, with a sprinkling of crushed bones added. The small, grassy-leaved kinds, of which *T. angustifolia* and *T. virginalis* are examples, may be grown in peat and sphagnum. All the species delight in abundant sunlight, a high temperature during summer, plenty of water (though the soil must not be kept saturated), and syringing overhead twice a day. In winter, they should be kept from getting quite dry, but need not be syringed. Nothing can exceed the beauty of many of the Tillandsias, when in good health, and bearing their richly-coloured flowers. There is no more beautiful plant than *T. Lindeni*, whilst *T. carinata, T. Morreni, T. psittacina*, and *T. splendens*, are most richly coloured. Propagation is effected by seeds and suckers, chiefly by the latter. They should be allowed to grow large before being detached from the parent, and inserted singly in pots just large enough to hold the sucker, using a compost of loam, peat, and leaf mould. The suckers must not be confined in a close frame for propagating, but kept moderately moist and well shaded. Spring is the best season for detaching them.

With the assistance of the following "Classified List of the Cultivated Tillandsias" (for which we are indebted to Mr. J. G. Baker, who has generously lent the manuscript of his unpublished Monograph for the purpose), the names of any of the species described below may be the more readily determined.

Leaves spaced out on a long stem . . . *Strepsia.*
Leaves crowded, rosulate, coriaceous, acuminate, densely lepidote.
Inflorescence distichous . . *Diaphoranthema. Phytarrhiza. Platystachys.*
Inflorescence multifarious . . *Anoplophytum. Pityrophyllum.*
Leaves rosulate, broader and thinner, obscurely lepidote.
Inflorescence distichous . . . *Allardtia. Wallisia. Vriesia.*
Inflorescence multifarious . . . *Cyathophora. Conostachys.*

Sub-genus I. Strepsia.

Flowers solitary in the axils of the stem leaves. Stems pendulous, filiform.
usneoides.

Sub-genus II. Diaphoranthema.

Flowers one or few; style and stamens short. Leaves subterete. Leafy stem short.
bryoides.
recurvata.

Sub-genus III. Phytarrhiza.

Flowers spicate or panicled; petal blade broad, spreading; style and stamens short. Leaves rosulate.
crocata.
Duratii
ixioides
xiphioides

Sub-genus IV. Platystachys.

Flowers spicate or panicled; petal blade lingulate; stamens and style longer than the calyx. Leaves rosulate.
anceps
angustifolia
Balbisiana
bulbosa
Caput-Medusæ
distachya
filifolia
flexuosa
glaucophylla
Karwinskiana
monadelpha
narthecioides
polystachya
pruinosa
setacea
streptophylla
tectorum
vernicosa
vestita
xiphostachys

Tillandsia—*continued.*

SUB-GENUS V. ANOPLOPHYTUM.

Flowers spicate or panicled. Leaves rosulate, narrow, acuminate.

dianthoidea
didisticha
Gardneri
geminiflora
pulchra
stricta

SUB-GENUS VI. PITYROPHYLLUM.

Flowers in a capitulum in the centre of the rosette of leaves.

brachycaulos
ionantha

SUB-GENUS VII. ALLARDTIA.

Differs from *Platystachys* only in leaf.

cyanea
Roezlii
virginalis

SUB-GENUS VIII. WALLISIA.

Differs from *Phytarrhiza* only in leaf.

Hamaleana
Lindeni
umbellata

SUB-GENUS IX. VRIESIA.

Petals white or yellow, large, with two scales on the claw. Leaves broad, usually lorate.

Spikes dense, simple.

Barilleti
Billbergiæ
carinata
chrysostachys
Duvaliana
gladioliflora
heliconioides
incurvata
splendens
viminalis
viridiflora

Spikes lax, simple.

amethystina
corallina
ensiformis
fenestralis
guttata
Jonghei
paraibica
Platzmanni
psittacina
psittacino-carinata
psittacino-scalaris
scalaris
Warmingii
Wawranea

Spikes disposed in a panicle.

gracilis
hieroglyphica
Morreni
Philippo-Coburgi
regina
reticulata
Rodigasiana
tessellata

SUB-GENUS X. CYATHOPHORA.

Differs from *Allardtia* in the inflorescence.

utriculata

SUB-GENUS XI. CONOSTACHYS.

Differs from *Vriesia* in the inflorescence.

Malzinei
Saundersii

T. acaulis (stemless). A synonym of *Cryptanthus acaulis.*

T. aloifolia (Aloe-leaved). A synonym of *T. flexuosa.*

T. amethystina (amethystine). *fl.* yellow, 2½in. long, distichous, distant, sub-sessile, tubular; petals twice the length of the sepals; anthers exserted; bracts greenish-yellow, small; spike distichous, the rachis pulvinate; scape slender, erect, exceeding the leaves, bracteate. *l.* 12in. to 16in. long, lingulate, acuminate, shining-green above, amethystine beneath. South Brazil, 1884. SYN. *Vriesia amethystina* (B. H. 1884, 15-16).

T. anceps (two-edged). *fl.* 2in. long; sepals pale yellow, keeled, imbricated; petals white and purplish, twice as long as the sepals; bracts greenish-yellow, red-margined, cymbiform, bluntly mucronate; spike oblong, solitary; scape nearly 1ft. long. June.

Tillandsia—*continued.*

l. numerous, imbricated, about 1ft. long, curved to one side, broad, sheathing, and very concave at base, becoming subulate above, dingy-green, whitish-scaly outside. West Indies and Central Mexico, 1824. SYNS. *T. setacea*, of Hooker (B. M. 3275), *T. tricolor* (B. H. 1879, 10-11), *Phytarrhiza anceps* (B. H. 1873, 20-1).

T. angustifolia (narrow-leaved). *fl.* blue; sepals half as long as the erect petals; bracts imbricate-distichous; central spike 4in., lateral ones 1½in. to 2in., long. August. *l.* linear from a subulate base, convolute, curved, about as long as, or longer than, the stem, lepidote. *h.* 1ft. to 2ft. West Indies, 1822.

T. argentea (silvery). A garden synonym of *T. Gardneri.*

T. argentea (silvery), of K. Koch. A synonym of *T. tectorum.*

T. Balbisiana (Balbis'). *fl.*, sepals exceeding half the petals, all distinct; petals violet, erect, convolute, spathulate-linear, 1½in. long; stigmas exserted; bracts green, red, and yellow, imbricate-distichous, oblong-lanceolate, acuminate, ten lines long; spike compound, compressed; lateral spikes three to eight, 2in. to 3in. long, appressed, alternate. *l.* lanceolate-linear from a subulate base, convolute, recurved, exceeded by the stem, lepidote. *h.* 1ft. to 1½ft. West Indies, 1874. (B. H. 1879, 6-7.)

T. Barilleti (Barillet-Dechamps'). *fl.* yellow; bracts yellowish-olive, very numerously spotted with dark blood-colour, distichous, clustered, conduplicate, navicular, equitant; spike simple, elongated, ancipitous; scape about as long as the leaves. *l.* green, smooth-edged, 16in. to 20in. long, shortly acuminate, with the margins rolled in at the middle. Andes of Ecuador, 1883. SYN. *Vriesia Barilleti* (B. H. 1883, 5).

T. Billbergiæ (Billbergia-like). *fl.* tricoloured (green, white, and red), sessile; corolla dilated. *l.* resembling those of *Billbergia*, quite glabrous, rosulate, imbricate, dilated, amplexicaul at the base, very thin, slightly recurved, oblong-ligulate, oblique, and very shortly and abruptly apiculate, sub-coriaceous, pale green, furfuraceous at the base outside. *h.* 10in. Mexico.

T. brachycaulos (short-stemmed). *fl.* purple, about twelve in a head, which is sessile amongst the leaves. *l.* linear, channelled, recurved, 6in. to 9in. long, red on the upper surface, greyish-green beneath, slightly scurfy. Central Mexico, 1878. A handsome, dwarf species. (B. H. 1878, 11.)

T. brachystachys (short-spiked). A synonym of *T. carinata.*

T. bryoides (Moss-like). *fl.* three or four in a small, distichous spike; style and stamens short; scape capillary, 2in. long. *l.* small, lanceolate-subulate. Stems slender, branched. South Brazil, &c., 1880. A small, Moss-like plant. SYN. *S. polytrichoides.*

T. bulbosa (bulbous). *fl.*, sepals distinct; petals violet, white at the point, 1½in. long, recurved at the summit, convolute spathulate-linear; bracts eight to nine lines long, imbricate-distichous; spikes five to eight, sub-equal, approximate, spreading, 2in. to 3in. long. November. *l.* convolute-filiform, greenish, minutely lepidote; rosulate ones dilated into the roundish sheaths of the bulbous stem-base, flexuous; uppermost ones exceeding the spikes. *h.* 8in. to 12in. West Indies, Buenos Ayres, &c., 1823. (H. E. F. 173.) SYN. *T. paucifolia. T. eminens, T. erythræa, T. inanis*, and *T. pumila*, are mere varieties of this species.

T. Caput-Medusæ (Medusa's Head). *fl.* six or seven to a spike; bracts green; spikes about four, forming a compound panicle; scape shorter than the leaves, clothed with elongated bracts. *l.* tumid at base, forming a kind of bulb, lanceolate, thick, channelled, divaricate, arched, undulated, unequal, shining, silky-grey. Mexico, 1880.

T. carinata (keeled).* *fl.* projecting ½in. beyond the bracts; sepals pale yellow, keeled; petals pale yellow, twice as long as the sepals, cohering nearly to the dark green tips; bracts green beyond the middle, scarlet below, 2in. long, closely imbricated, laterally much compressed; spike 5in. long, broadly ovate, the rachis scarlet; scape scarlet, 6in. long, stout, cylindric, the sheaths green-tipped. November. *l.* 4in. to 6in. long, 1in. to 1½in. broad, spreading and recurved, pale green, broadly strap-shaped from a dilated, sheathing base. South Brazil, 1866. A very brilliant plant. SYNS. *T. brachystachys, Vriesia brachystachys* (B. M. 6014; R. G. 1866, 518), *V. psittacina brachystachys* (B. H. 1870, 8), *V. p. carinata* (B. H. 1882, 10-12).

T. chrysostachys (golden-spiked). *fl.* yellow, regular; sepals free, lanceolate; petals longer, ligulate, obtuse; bracts yellow, conduplicate; spike simple, distichous, elliptic, elongated; scape elongated, erect, bracteate. *l.* numerous, rosulate, lax, arched, coriaceous, short and broad, loriform, lingulate at base, of a pleasing green, but rosy and glaucescent beneath towards the base. Stem short. Andes of Peru, 1881. (B. M. 6906.)

T. circinalis (crozier-like). A synonym of *T. Duratii.*

T. circinata (crozier-like). A synonym of *T. streptophylla.*

T. complanata (complanate). A synonym of *T. xiphostachys.*

T. corallina (coral-red).* *fl.* green, distant, refracted, each subtended by a long, purplish-crimson bract, the scape and rachis being of the same brilliant colour; petals large, with two scales on the claw; spikes distichous. *l.* oblong-ligulate, blunt and apiculate, green. Minas Geraes, 1871. SYNS. *Encholirion corallinum* (F. M. n. s. 116), *Vriesia corallina* (R. G. 1870, 671).

Tillandsia—*continued.*

T. c. rosea (rosy). This differs from the type in its rose-tinted flowers. SYN. *Encholirion roseum.*

T. cordobensis (Cordoba). A synonym of *T. recurvata.*

T. crocata (saffron-yellow). *fl.* of a saffron-yellow colour, about five in a short, elliptic, distichous spike; scape elongated, slender, villous, nearly naked. *l.* distichous, long, linear-subulate, recurved, covered with silky, white hairs. Stem undulated, branched. South Brazil, 1880. SYN. *Phytarrhiza crocata.*

T. cyanea (blue). *fl.* blue, in a branching panicle from the centre of a rosette of strap-shaped, entire leaves. *h.* 2½ft., when in flower. Guatemala, 1852. SYNS. *Allardtia cyanea, Platystachys cyanea.*

T. dianthoidea (Dianthus-like). *fl.*, corolla tubular, the tube cylindrical, the limb blue, spreading or reflexed; bracts purplish-rose, ovate-lanceolate, acute, persistent; spike loose, six to ten-flowered. *l.* amplexicaul, the outer ones recurved, the inner ones erect or inflexed, coriaceous, rigid, triquetrous towards the apex, acute, entire, silky-glaucous. Stem nearly terete, simple, ascending, 3in. to 5in. long. Uruguay, &c., 1810. (R. G. 85.) SYN. *T. stricta*, of Lindley (B. R. 1338).

T. d. rosea (rosy). *fl.* white, issuing from rosy-pink bracts; scape short. *l.* glaucous, lanceolate-subulate, recurved, channelled. 1861. SYNS. *T. recurvifolia* (B. M. 5246), *T. rosea* (B. R. 1357).

T. didisticha (twice-two-rowed). *fl.* white; spikes elliptic, forming a crowded, distichous panicle; scape elongated, arched, clothed with bracts. *l.* thick and robust, disposed in a rosette, lanceolate, channelled, acuminate, cinereous. South Brazil, 1881. SYN. *Anoplophytum didistichum.*

T. distachya (two-spiked). *fl.*, sepals ⅔in. long, free to the base; corolla white, more than twice as long as the calyx, the petals oblanceolate, with a long claw; bracts green, oblong-lanceolate, about 1in. long; spikes two, distichous, six to twelve-flowered; scape erect, 6in. long, hidden by its linear, falcate leaves. *l.* twelve to fifteen in a sessile rosette, lanceolate, acuminate, about 1ft. long, the dilated base 1in., the middle of the lamina ½in., broad, the face pale green, concave, glabrous upwards, thinly lepidote towards the base, the convex back thinly lepidote throughout. *h.* 1ft. British Honduras, 1879.

FIG. 37. TILLANDSIA DURATII, showing Habit and detached Inflorescence.

T. Duratii (Durati's). *fl.* violet; panicle compact, 3in. to 4in. long, composed of several dense, few-flowered spikes; scape 6in. high. *l.* twelve to twenty, spreading, 6in. to 9in. long, gradually tapering to a thick, subulate, channelled more or less circinate tip, everywhere densely silvery-lepidote. Uruguay, 1879. See Fig. 37. SYNS. *T. circinalis, T. revoluta Wallisia Duratii.*

Tillandsia—*continued.*

T. Duvaliana (Duval's). *fl.* yellow, green at apex; bracts scarlet below, green above, conduplicate, keeled, beaked, equitant; spike simple, elongated-elliptic, about eighteen-flowered; scape erect, about 1ft. high. *l.* membranous, short, lanceolate, green above, tinged with red beneath, the sheath broad. South Brazil, 1884. SYN. *Vriesia Duvaliana* (B. H. 1884, 7-8).

T. eminens (eminent). A form of *T. bulbosa.*

T. ensiformis (sword-shaped). *fl.* of a reddish-yellow colour June. *l.* tongue-shaped, yellow-green, about 1ft. long, the edges entire. *h.* 1½ft. Brazil.

T. erubescens (blushing). A garden synonym of *T. ionantha.*

T. erythræa (red). A form of *T. bulbosa.*

T. fenestralis (fenestrate). *fl.*, sepals long, elliptic, convolute in a tube; petals pale yellow, longer, very broad; spike distichous, elongated; scape erect, long, robust. *l.* coriaceous, about 12in. long, broad, arched, concave, pale, beautifully marked with pellucid reticulations in the upper half, rounded-mucronate at apex, slightly spotted with red at base. Parana, 1875. Plant tufted. (B. M. 6898.) SYN. *Vriesia fenestralis* (B. H. 1884, 4-5; I. H. n. s. 215).

T. filifolia (thread-leaved). *fl.* pale blue, small, distichous, with reflexed petals; inflorescence paniculate, not unlike that of some of the species of *Statice*, with lax, drooping branches. *l.* subulate, filiform, spreading. Mexico, Vera Cruz, &c., 1871. A very elegant, dwarf, densely-tufted plant. SYN. *T. staticiflora* (B. H. 1871, 12).

T. flexuosa (flexuous). *fl.* rosy, distant; sepals 1in. long; petals 2in. long, linear, spreading at the summit; bracts rosy, distichous, spreading, oblong-lanceolate, bluntish; spike with a few long, spreading branches, or simple. *l.* linear, acuminate, subulate at base, recurved, shorter than the stem, lepidote with minute scales or greenish, transversely zonate beneath. *h.* 1½ft. to 3ft. West Indies, &c., 1790. (B. R. 749.) SYNS. *T. aloifolia* (H. E. F. 205), *T. tenuifolia* (of Jacquin).

T. Gardneri (Gardner's). *fl.*, sepals glabrous; petals pale purplish, small; spikes four to eight, short, distichous, crowded; bracts lepidote; scape 2in. to 4in. high, densely sheathed with linear-subulate, lepidote leaves. *l.* 6in. to 8in. long, flat in the lower part, narrowed from a ⅓in.-broad base to a reflexing, subulate, convolute point, everywhere densely covered with silvery scales. South Brazil, &c., 1879. SYNS. *T. argentea* (of gardens), *Anoplophytum incanum* (B. H. 1881, 11).

T. geminiflora (twin-flowered). *fl.* madder-coloured; sepals shorter than the petals, the limb of which is reflexed; filaments sigmoid towards the apex; bracts red, lanceolate, mucronate, rather longer than the sepals; spike oblong, sub-compound; scape erect, clothed with red, green-tipped, acuminate sheaths. February. *l.* ovate-lanceolate, channelled, acuminate, the outer ones spreading-recurved. South Brazil, &c., 1840. SYNS. *T. rubida* (B. R. 1842, 63), *Anoplophytum geminiflorum* (B. H. 1880, 11).

T. gigantea (gigantic). A form of *T. regina.*

T. gladioliflora (Gladiolus-flowered). *fl.* greenish-violet; spike simple; bracts green, closely imbricated. *l.* broadly ligulate, abruptly acuminate, glabrous. Costa Rica, 1863.

T. glaucophylla (glaucous-leaved).* *fl.*, sepals greenish-white; petals purple, almost white at apex, convolute, erect; filaments banded with purple; lower bracts red, the rest green tinged with yellow and red; spikes four or five, 9in. long; scape red, 1ft. or more long. August. *l.* imbricated round a rather tumid base, spreading, recurved, 1ft. to 1½ft. long, gradually tapering from a broad and rather concave base to a slender point, sub-farinose or flocculose. Santa Marta, 1847. SYN. *Vriesia glaucophylla* (B. M. 4415; F. d. S. 432).

T. gracilis (slender). *fl.* remote, sessile, distichous; petals oblong, slightly dilated and scarcely spreading at apex; bracts reddish at base, greenish towards the apex; panicle loose, erect, the branches erecto-patent, five to eight-flowered, 6in. to 8in. long; scape 2ft. to 2½ft. high. *l.* entire, of a pleasing green, 10in. to 12in. long, broad and semi-amplexicaul at base, attenuated towards the acute apex. Forests of Southern Brazil, 1886. SYN. *Vriesia gracilis* (R. G. 1886, p. 163).

T. guttata (spotted). *fl.* numerous, distichous, approximate; sepals citron-coloured, with reddish marks, elliptic; petals yellow, obovate-ligulate; bracts light rose-coloured, broad, conduplicate, nearly equalling the calyx, farinose; spike simple, very long, pendulous; scape arched. *l.* short, slightly acute, mucronate, olivaceous, richly spotted and blotched with dark purple. South Brazil, 1875. SYN. *Vriesia guttata* (B. H. 1880, 1-3; I. H. n. s. 200).

T. Hamaleana (Hamale's).* *fl.* sessile, bifarious, fragrant; sepals green, ovate-lanceolate; claw of petals white, linear, channelled, the limb beautiful violet, snow-white at base, rhomboid-dilated, spreading-reflexed, obcordate; bracts green and purplish, lepidote, conduplicate; spike compound, the branches distichous; spike erect, longer than the leaves, with remote, reddish bracts. *l.* approximate, divaricate, the lower ones arcuate-deflexed, the upper ones erect, linear, concave, uncinate-revolute at apex, unarmed, not lepidote. Andes of Peru, 1870. (B. H. 1870, 5.) SYNS. *Phytarrhiza Hamaleana, Wallisia Hamaleana.*

Tillandsia—*continued.*

T. heliconioides (Heliconia-like). *fl.* sessile, distant; sepals whitish, striated, lanceolate, acuminate, concave; corolla white, tripartite, the segments lanceolate-linear; bracts striated, ovate, acute, keeled, spreading, 1in. or more long; spike 4in. to 6in. long. *l.* linear-lanceolate, subulate at apex, nearly flat, glabrous, coriaceous, striated, recurved, 1½ft. long. Stem simple, scarcely 1ft. long, leafy. Rio Magdalena Valley. SYNS. *Vriesia bellula* and *V. Falkenbergii* (of gardens), *V. heliconioides* (G. C. n. s., xxi., p. 140; I. H. n. s. 490).

T. hieroglyphica (hieroglyphic). *fl.* disposed in a lax panicle; bracts ovate, conduplicate, short; panicle branches spreading, short, naked at base, bearing seven or eight pedicellate flowers. *l.* forming a tuft 5ft. to 7ft. in diameter, long, loriform, broad, especially at base, glabrous, mucronate, obtuse, green, very handsomely marked above with dark green, and below with blackish-purple. South Brazil. An exceedingly handsome foliage plant. SYNS. *Massangea hieroglyphica* (R. H. 1878, p. 175), *Vriesia hieroglyphica* (B. H. 1885, 10-12; I. H. 1884, 514). For some time after it was introduced, the flowers of this species were unknown. In 1885, however, it flowered in the Brussels botanical garden, and was then found not to be a Massangea at all; therefore, this species should not be referred to *Caraguata*, as mentioned under *Massangea*.

T. inanis (uninteresting). A form of *T. bulbosa*.

T. incurvata (incurved). *fl.* yellow, tipped with green, subsessile, long-tubular; petals ligulate, the limb obtuse, recurved; bracts beautiful orange and red, conduplicate, keeled, ovallanceolate; spike dense, stout, distichous. *l.* green, lorate, shortly acuminate, widened at base. South Brazil, 1882. SYNS. *T. inflata* (B. M. 6882), *Vriesia incurvata* (B. H. 1882, 2).

T. inflata (inflated). A synonym of *T. incurvata*.

T. ionantha (violet-flowered).* *fl.* sessile, crowded at the tips of the branches; petals pale violet, convolute by their linear, broad claws; bracts lanceolate, equalling the sepals. *l.* numerous, closely imbricated, 2in. to 2½in. long, recurved, subulate-lanceolate, very coriaceous, concave above, sub-pungent at tip, the margins ciliated; upper ones more erect, bright rose-coloured, at length wholly green. *h.* 3in. to 4in. Brazil (?), 1871. Plant tufted. (B. M. 5892; F. d. S. 1006.) SYNS. *T. erubescens* (of gardens), *Pitrophyllum ionantha*.

T. ixioides (Ixia-like). *fl.* three to five in a spike, sub-tristichous; sepals equalling the claw of the petals; petals orange; limb only half as long as the claw; anthers included. *l.* imbricated, linear, acuminate, slightly dilated at the base, with silvery scales on the dorsal nerve. *h.* 6in. Uruguay.

T. Jonghei (Jonghe's). *fl.* tawny-yellow, rather remote, horizontal; sepals greenish, with fuscous margins, ovate, convex, bidentate at apex; corolla campanulate, the petals obtuse, emarginate; bracts fuscous-green, conduplicate, plicate, gibbous at base, shorter than the sepals; spike simple, ancipitous, the rachis distichous-pulvinate; scape erect, simple, longer than the leaves, with lanceolate, leafy bracts. *l.* lorate, recurved, fuscous-purplish beneath. Minas Geraes, 1874. (B. H. 1874, 12-13.) SYN. *Vriesia Jonghei*.

T. juncifolia (Rush-leaved). A synonym of *T. setacea*.

T. Karwinskiana (Karwinsky's). *fl.* one to twelve arranged in a single lax, narrow, distichous spike; sepals glossy-green, glabrous; petals violet; scape 9in. to 12in. long. Winter. *l.* twenty to thirty in a dense rosette, 1ft. long, narrowed from a base 1in. broad to a long point, pale green, lepidote on the back, nearly or quite naked on the face. Mexico, 1878.

T. Lindeni (Linden's).* *fl.* axillary, sessile; sepals green, reddish at apex, lanceolate, acuminate, channelled; petals spathulate, the claw linear, the limb of a beautiful bluish-purple, spreading, ovate, sub-acuminate; stamens included; bracts very densely distichous-imbricate, cymbiform, keeled, entire, truncate at apex, smooth, the included base greenish, the outer part of a beautiful carmine; spike terminal, simple, ovate, compressed, rather shorter than the leaves, about twenty-flowered. *l.* rosulate, 8in. to 12in. long, ½in. to ¾in. broad, spreading-recurved, attenuated, acuminate, entire. Andes of Peru, 1867. A handsome species. (B. H. 1869, 18; F. M. 1872, 44; I. H. 1869, 610.) SYNS. *T. Morreniana, Phytarrhiza Lindeni*.

T. L. intermedia (intermediate). *fl.*, bracts green, slightly shaded with rose-colour; scape longer than in the type. 1871. An intermediate form between the type and *T. L. Regeliana*. (F. M. 1871, 529.)

T. L. luxurians (luxuriant). *fl.*, scapes many, axillary, elongated. 1871. (B. H. 1871, 20-21.)

T. L. major (greater).* *fl.* bright azure-blue, with a white centre, much larger than in the type. 1871. (F. M. n. s. 529.)

T. L. Regeliana (Regel's). *fl.*, bracts green; spike narrower than in the species; scape elongated. 1877. (G. C. n. s., xii., p. 461.) SYN. *T. Lindeniana* (R. G. 1869, 619).

T. Lindeniana (Linden's). A synonym of *T. Lindeni Regeliana*.

T. Malzinei (Omer de Malzine's). *fl.* twelve to twenty in a dense, simple, multifarious spike; petals white, lingulate, twice as long as the calyx, with a pair of white, fimbriated scales at the base; bracts yellow or red, ovate-navicular, above 1in. long. April. *l.* fifteen to twenty in a dense rosette, about 1ft. long, 3in. broad

Tillandsia—*continued.*

at the dilated base, falcate, chartaceous, deltoid-cuspidate at apex, bright green on the face, red-brown with fine vertical lines at back. Mexico, 1874. Acaulescent. (B. M. 6495.) SYN. *Vriesia Malzinei* (B. H. 1874, 14).

T. monadelpha (monadelphous). *fl.* about twenty, whitish, tinged with light purple, rather remote, sub-sessile; petals spathulate, the limb spreading; stamens monadelphous at base; bracts conduplicate, green, tinged with yellow, shining; spike simple, loose, the rachis distinctly pulvinate, green; scape erect, longer than the leaves. *l.* numerous, broad and green at the base, above arcuate, lanceolate, acute, purple on both sides. Guiana, 1882. SYN. *Phytarrhiza monadelpha* (B. H. 1882, 7).

T. Morreni (Morren's).* *fl.* secund, one sessile in the axil of each viscid, brown bracteole; calyx light brown, about twice the length of its bracteole; petals yellowish-green, very narrow; panicle pyramidal; bracts straw-coloured. *l.* two, 2¼in. broad, erect, 1½ft. long, sub-coriaceous, with broken, zigzag, transverse markings; tip rounded, minutely mucronate. *h.* 15in. Brazil.

T. Morreniana (Morren's). A synonym of *T. Lindeni*.

T. muscosa (mossy). A garden synonym of *Pitcairnia muscosa*.

T. narthecioides (Narthecium-like). *fl.* yellowish-white, inconspicuous, distant, nearly horizontally spreading; bracts glabrous, as long as the calyx, oblong, striated; spike 4in. long, erect, simple; scape 6in. high, erect. *l.* linear, flat, 8in. long, ¼in. broad, subulate at apex, dilated at base. Guayaquil, 1878.

T. nitida (shining). A synonym of *Catopsis nitida*.

T. paraibica (Parahiba). *fl.* in a densely-imbricated, distichous spike; bracts large, purple-red, as long as the golden-yellow calyx; petals yellow, much longer than sepals. Summer. *l.* green, shining, lingulate, 6in. to 9in. long, about 1in. wide, about as long as the scape. *h.* 6in. to 9in. Brazil, 1885.

T. paucifolia (few-leaved). A synonym of *T. bulbosa*.

T. Philippo-Coburgi (Prince Philip of Saxe-Coburg's). *fl.* distant, secund; calyx golden-yellow; petals greenish, protruding at the summit of the calyx a third longer, the included part folded into a very narrow tube; panicle pyramidal, the branches red; lower bracts large, dark red; bracteoles bright red, scarious, clasping at the base, oblong-lanceolate, very acute. *l.* 2½in. broad, rigidly membranous, light green, shining, the apex reddish-brown; sheath slightly dilated, variegated with pale purplish blotches. *h.* 15in. Brazil. SYN. *Vriesia Philippo-Coburgi*.

T. picta (painted). A garden synonym of *T. splendens*.

T. Platzmanni (Platzmann's). *fl.* yellow, distichous, rather remote, shortly pedunculate, tubular; sepals fuscous at base, convolute in a tube; petals also convolute; bracts purplish, navicular; spike simple, secund, about ten-flowered; scape 3ft. to 4ft. high, slender, erect, bracteate. *l.* lingulate, broad at base, green, margined with red. South Brazil, 1875. SYN. *Vriesia Platzmanni* (B. H. 1875, 23).

T. polystachya (many-spiked). *fl.* sessile; calyx bipartite; petals blue, rarely white, linear, channelled-concave, acuminate; bracts scarlet, imbricated above; spikes numerous, the lateral ones about ten, 1ft. long, alternate. June. *l.* linear-subulate, acuminate, entire, channelled, broad and ventricose at base, the lower ones 2ft. long. Stem leafy, erect, 3ft. high. West Indies, &c., 1825.

T. polytrichoides (Polytrichum-like). A synonym of *T. bryoides*.

T. pruinosa (pruinose). *fl.*, sepals seven to eight lines long, all distinct; petals blue, fourteen to sixteen lines long, convolute, spreading at the summit, spathulate above the claw; bracts rose-coloured, 1in. long, distichous, approximate, ovate-oblong, pointed; spike simple, 2in. to 3in. long. *l.* convolute-filiform from a subulate base, recurved, as long as the stem. *h.* 4in. to 6in. West Indies, Brazil, &c. Plant wholly covered with spreading, white scales. (B. H. 1876, 16-17.)

T. psittacina (parrot-like).* *fl.* large, remote, distichous; petals green at the point, rather longer than the bracts, which are bright red in the lower part, and deep yellow above; rachis red; scape 1ft. or more high. July. *l.* radical, 6in. to 8in. long, linear-ligulate, much inflated, recurved, acute, entire, yellow-green, thin, more or less waved. Forests near Rio Janeiro, 1828. (B. M. 2341.) SYN. *Vriesia psittacina* (B. H. 1872, 10-12; B. R. xxix. 10). Morren unites with this *T. carinata* as a variety.

T. psittacino-carinata (hybrid). A good and handsome garden hybrid, having more numerous and approximate flowers than *T. psittacina*. 1883. SYN. *Vriesia Morreniana* (B. H. 1882, 10-12, f. 2.)

T. psittacino-scalaris (hybrid). *fl.* as in *T. psittacina*, ten to fifteen on a reflexed rachis; internodes short; scape arcuate, dependent. 1885. Habit stouter than *T. scalaris*. SYN. *Vriesia retroflexa* (B. H. 1884, 10.)

T. pulchella (pretty). A synonym of *T. pulchra*.

T. pulchra (beautiful).* *fl.*, calyx greenish-white; petals quite white; bracts of a beautiful, delicate red, imbricated and sheathing, almost entirely concealing the flowers; scape, including the spike, about as long as the leaves. *l.* 4in. to 6in. long, quite subulate, hoary with a minute, scurfy pubescence, channelled,

Tillandsia—*continued.*

especially towards the base. South Brazil, &c., 1840. Plant tufted. SYNS. *T. pulchella* (B. H. ix. 322; B. M. 5229), *Pourretia surinamensis* (of gardens).

T. p. amœna (pleasing). *fl.*, sepals pink; petals much longer, with a white claw and a lilac limb; spike few-flowered; scape erect, sheathed by pink bracts. *l.* narrow-subulate. Stem branched, flexuous. SYN. *Anoplophytum amœnum* (B. H. 1883, 17).

T. pumila (dwarf). A form of *T. bulbosa.*

T. recurvata (recurved). *fl.*, sepals about three-fourths as long as the blue corolla; petals naked within, spreading above the calyx; peduncles axillary or terminal, sub-solitary, exserted, two to five-flowered; spike included by a sheathing bract, each flower by a smaller bract, the upper ones somewhat distant. *l.* 2in. to 3in. long, filiform, recurved. Stems tufted. Scaly down spreading. *h.* about 6in. Tropical America, 1793. SYN. *T. cordobensis.*

T. recurvifolia (recurved-leaved). A synonym of *T. dianthoidea rosea.*

FIG. 38. TILLANDSIA REGINA.

T. regina (queen).* *fl.* white, exhaling a strong, Jasmine-like perfume; bracts rose-coloured; spikes two-ranked, curved, disposed in a branched panicle; scape developing very rapidly, eventually attaining a height of about 7ft. *l.* about 4ft. long, recurved at apex, broadly sheathing at base. South Brazil, 1867. A magnificent plant. See Fig. 38. SYNS. *Vriesia gigantea, V. Glaziovana, V. regina* (G. C. n. s., iii., p. 235). *T. gigantea* is merely a form of this species.

T. reticulata (netted-leaved). *fl.* in a paniculate inflorescence, 1ft. or more long; calyx greenish, 1½in. long; petals milk-white, ¼in. longer than the calyx; stamens longer than petals. Spring. *l.* lorate-lanceolate, 1½in. to 2ft. long, in a dense rosette, 3in. above the dilated base, moderately firm in texture, nearly naked on both sides, copiously reticulated with fine transverse lines of dark green on a pale green ground. *h.* 1½ft. to 2ft. Rio Grande do Sul, 1870. SYNS. *Guzmannia reticulata, Vriesia reticulata.*

T. revoluta (revolute). A synonym of *T. Duratii.*

Tillandsia—*continued.*

T. Rodigasiana (Rodigas'). *fl.* citron-yellow, distichous, remote, sub-sessile, spreading, tubular; sepals obtuse; petals thrice as long as the sepals, ligulate, the limb arcuate; bracts tinged with red, striated, ovate, short; panicle loose, elongated, elliptic, the branches spreading, few-flowered, nearly sessile, springing from a short, scarlet spathe; scape elongated, erect, slender, with narrow bracts. *l.* short, arcuate-spreading, broadly sheathing and fuscous at base, the blade loriform, slightly channelled, rounded-cuspidate, green, with a few dark blood-coloured markings. South Brazil. Closely allied to *T. gracilis.* SYN. *Vriesia Rodigasiana* (I. H. n. s. 467.)

T. Roezlii (Roezl's). *fl.* rosy; spikes distichous, ancipitous, elliptic, forming a tall panicle. *l.* large, linear, acute, dark green, with large, black blotches on the upper part, the margins incurved. Andes of Northern Peru, 1877. A plant of bold habit. (B. H. 1877, 15.)

T. rosea (rosy). A synonym of *T. dianthoidea rosea.*

T. rubida (reddish). A synonym of *T. geminiflora.*

T. sanguinolenta (blood-red). *l.* deflexed at the apex, with numerous irregular blotches of dark blood-red on both surfaces. *h.* 9in. to 12in. New Granada, 1875. As the flowers of this species are unknown, it has been impossible to place it in the key, or even to state with certainty whether it is really a Tillandsia or no. SYN. *Encholirion sanguinolenta* (I. H. 1875, 200).

T. Saundersii (Saunders').* *fl.* sulphur-yellow; sepals equitant, oblong, concave; panicle loose, the primary raceme few-flowered, divaricate, bracteate; scape erect, shining, angled, yellowish-white. *l.* rosulate, short, deeply and broadly sheathing at base, linear, obtuse, decurved, coriaceous, above greyish-green, slightly dotted with white, below striated and spotted with blood-colour. *h.* 1½ft. Brazil, 1872. SYN. *Encholirion Saundersii* (I. H. n. s. 132).

T. scalaris (ladder-like). *fl.* very long and pretty; calyx yellow; corolla green; bracts of a deep rose-colour; scape 1½ft. to 2ft. long, hanging from the plant like a rope ladder. *l.* ligulate, about 10in. long, green, ciliated. South Brazil, 1879. SYN. *Vriesia scalaris.*

T. setacea (bristly). *fl.*, sepals half as long as the corolla; petals bluish-purple, spathulate, 1in. long, spreading at the summit; bracts lepidote, imbricate-distichous, ovate-oblong, pointed, as long as the sepals; spike 2in. to 3in. long, compressed, simple, or with a few short, appressed branches at the base. *l.* convolute-filiform, little or gradually dilated at base, sub-erect, equalling or exceeding the scape. *h.* 8in. to 18in. West Indies to Brazil, 1825. (Ref. B. 288.) SYNS. *T. juncifolia* (R.G. 811), *T. tenuifolia* (of Linnæus), in part (B. H. 1876, 14).

T. setacea (bristly), of Hooker. A synonym of *T. anceps.*

T. speciosa (showy). A garden synonym of *T. splendens.*

T. splendens (splendid).* *fl.*, calyx free, the sepals oblong-lanceolate; petals yellow, free, linear or linear-oblong, slightly dilated-spathulate at apex, thrice the length of the calyx; bracts fiery-purple, lanceolate, acute, keeled, oblique, closely imbricated; spike simple, distichous, compressed, ancipitous, linear-lanceolate, longer than the scape; scape erect, simple, longer than the leaves, the closely-appressed scales green, fuscous-spotted. *l.* eight to twelve, linear-oblong, concave at base, nearly 2ft. long, 3in. broad, flat and abruptly narrowed towards the recurved apex, of a pleasing green above, lighter beneath, with transverse, dark fuscous zones. French Guiana. See Fig. 39. (F. d. S. May, 1846, 4.) SYNS *T. picta, T. speciosa,* and *T. zebrina* (of gardens), *Vriesia splendens.*

T. staticiflora (Statice-flowered). A synonym of *T. filifolia.*

T. streptophylla (twisted-leaved). *fl.*, calyx ½in. long, hidden; corolla bright lilac, cylindrical, 1½in. long; bracts densely lepidote, much imbricated; spikes four to eight in a short panicle; peduncle short, hidden by its numerous red-tinted, lepidote, imbricated, bract-like leaves. *l.* in a dense, basal rosette, the erect, dilated base 3in. long and broad; blade 6in. to 9in. long, 1in. broad at base, gradually tapering to a long point, much twisted spirally from low down, densely lepidote. Jamaica, &c., 1878. (B. M. 6757.) SYN. *T. circinata.*

T. stricta (erect). *fl.* narrow-cylindrical, about ¾in. long; calyx pale reddish-brown; corolla deep violet-blue above the calyx, finally deep red; bracts white, red-tinged, slightly pellucid; scape about 7in. high. November. *l.* springing from a short, fleshy rootstock about 6in. long, nearly ½in. broad at the base,

Tillandsia—*continued.*

coated with hoary pubescence. Brazil, &c., 1810. (B. M. 1529.) SYN. *Anoplophytum strictum* (B. H. 1878, 13).

T. s. caulescens (caulescent). This only differs from the type in its stem being decidedly developed, and, consequently, in the greater stature of the plant.

T. stricta (erect), of Lindley. A synonym of *T. dianthoidea.*

T. tectorum (growing on roofs). *fl.*, sepals free, lanceolate, conduplicate; petals white, blue in the middle, convolute in a tube which broadens towards the apex; bracts light green, tinged with rose, lanceolate, conduplicate, rather shorter than the sepals; spikes distichous, ancipitous, short, forming a short, contracted panicle; scape erect, tall, its bracts rosy at base. *l.* very numerous, imbricated, lanceolate-linear, spreading, arched, scarious-pilose; sheath very broad, gradually attenuated into the limb. Stem elongated, ascending, leafy. Andes of Peru, 1865. (B. H. 1877, 18.) SYNS. *T. argentea* (of K. Koch), *Pourretia nivosa* (of gardens).

T. tenuifolia (slender-leaved), of Jacquin. A synonym of *T. flexuosa.*

T. tenuifolia (slender-leaved), of Linnæus. A synonym of *T. setacea.*

FIG. 39. TILLANDSIA SPLENDENS.

T. tessellata (tessellated). *fl.*, sepals green, glutinous; petals yellow, forming a campanulate corolla; bracts green; panicle tall, erect, loose, the branches erect, arcuate, each bearing nine to twelve sub-sessile flowers; scape equalling the leaves, furnished with navicular bracts. *l.* coriaceous, rigid, channelled, tessellated in green and yellow, sub-glaucescent, acuminate at apex, the sheath broad, dark fuscous. South Brazil, 1882. SYN. *Vriesia tessellata* (B. H. 1882, 14-16).

T. tricolor (three-coloured). A synonym of *T. anceps.*

T. umbellata (umbellate).* *fl.* sapphire-blue, white in the centre, five or six opening simultaneously; calyx green; bracts light green, as large as the sepals; inflorescence a very short, ancipitous spike. Winter. *l.* 9in. to 12in. long, ¼in. broad, light green, shortly sheathing at the base, ascending, spreading, filiform, acute at the tips, smooth and glossy. *h.* 1ft. Ecuador, 1882. (R. H. 1886, p. 60.) A near ally of *T. Lindeni.*

T. usneoides (Usnea-like). Long Moss; Old Man's Beard; Spanish Moss, of the West Indies. *fl.* green, solitary, terminal, about ½in. long; sepals tinged with red. July. *l.* alternate, bifarious, uniform throughout, spreading, 1in. to 3in. long, filiform, grooved above; sheaths ½in. to 2in. long, cylindric. Tropical America, 1877. Plant forming loose, pendulous tufts, sometimes many feet long, clothed everywhere with a spreading, silvery scurf. (B. H. 1877, 17; B. M. 6309.)

T. utriculata (bladder-like). *fl.*, sepals green, reddish-margined, half as long as the corolla; petals greenish-white, spreading at the summit; bracts green, reddish-margined, distichous, erect, oblong, blunt, longer than the internodes; spike compound, the branches long and distant. *l.* linear, acuminate, gradually tapering from an ovate base, spreading, recurved at the top, shorter than the stem. West Indies, &c., 1793.

Tillandsia—*continued.*

T. vernicosa (polished). *fl.* white; spikes panicled; distichous; peduncle under 6in. long. *l.* few, ensiform, polished. Parana, 1887.

T. vestita (clothed). *fl.* yellow, forming a long, cylindrical tube, exserted about 1in. from the red calyx; spike simple, few-flowered. May. *l.* linear-subulate. *h.* 6in. Mexico, 1886.

T. viminalis (twiggy). *fl.* white, 1½in. long, ½in. in diameter; petals oblong, obtuse, forming a campanulate corolla; bracts green; spike simple, distichous, dense, fusiform; scape twiggy, 2ft. high, covered with scarious bracts. *l.* in a large, open rosette, membranous, shining, ligulate, acute, recurved, entire, 1ft. long, 1½in. to 2in. broad. Costa Rica, 1873. SYNS. *T. viridiflora* (of gardens), *Vriesia viminalis* (B. H. 1873, 14-15).

T. virginalis (fragile).* *fl.* sessile; sepals green, included; corolla claviform; ample, the petals white, obovate; bracts green, conduplicate, ample, farinaceous; spike simple, distichous, elliptic, ancipitous. *l.*, primordial ones filiform; the rest lorate, with a broad sheath, pale green, farinaceous. Mexico, 1873.

T. viridiflora (green-flowered). *fl.*, petals green, fugacious; spike simple, dense, 12in. long; bracts 2in. to 2½in. long; peduncle 1½ft. to 2ft. long. Summer. *l.* twelve or more, about 1ft. long, lorate. Mexico, 1887.

T. viridiflora (green-flowered), of gardens. A synonym of *T. viminalis.*

T. Warmingii (Warming's). *fl.* yellow, rather distant, numerous, distichous, erecto-patent, tubular; petals ligulate, revolute at apex; bracts golden-yellow, tipped with green, coriaceous, ovate, closely covering the flowers; spike long, simple, the rachis rigid; scape 3ft. to 4ft. high. *l.* coriaceous, about 3ft. long and 2in. broad, slightly spreading, green, marbled and tinged with dark rose-colour, especially in the lower part, the sheath broad. South Brazil, 1884. SYN. *Vriesia Warmingii* (B. H. 1884, 12-13).

T. Wawranea (Wawra's). *fl.* ten to twelve, arranged distichously at the summit of a scape, which is clothed with green, adpressed bracts, and is somewhat shorter than the leaves; calyx green; petals waxy-yellow, pointed, recurved; filaments and pistil shorter than the petals. Summer. *l.* 18in. long, 2½in. to 3in. wide, glaucous, bluish-green, with fine, transverse, wavy lines, a dark brown blotch just under the mucro, and dark chestnut-brown at the base; rosette with about a score leaves. *h.* 1½ft.

T. xiphioides (Xiphion-like).* *fl.* snow-white, numerous; sepals linear-lanceolate, acuminate; petals with a slender, linear claw, 1in. long, and a broadly obovate, acuminate, reflexed, crisped blade; bracts 2in. long, closely imbricated; spike 3in. to 4in. long, reflexed, distichous; scape long or short. May. *l.* crowded, rosulate, 4in. to 6in. long, ½in. broad at base, broadly subulate, with recurved margins that are involute at the tip. Argentine Republic and Uruguay, 1810. Plant covered with silvery-grey tomentum, deliciously scented, and remarkably pretty. (B. M. 5562; B. R. 105.)

T. xiphostachys (dagger-spiked).* *fl.* deep rich purple, only one opening at a time; bracts green, becoming tinged with bright yellow, and bright red towards the base, closely placed, sharply cymbiform; spike singularly flattened, solitary, 6in. long, 1in. broad. August. *l.* 9in. to 12in. long, from a broad, convex base, gradually tapering to a subulate point, entire, dark glaucous-green; lower ones purplish at base. Mexico and Venezuela. 1861. SYNS. *T. complanata* (B. H. 1872, 23), *Vriesia xiphostachys* (B. M. 4287).

T. zebrina (zebra-striped). A garden synonym of *T. splendens*

TILLETIA (named in honour of Matthieu Tillet, a French botanist of the eighteenth century). A genus of Fungi, parasitic on grasses. The most conspicuous species (*T. Caries* = *T. Tritici*) is found in the ovaries or immature fruits of the various kinds of Wheat, which it fills with a mass of dark brown spores. Externally, the grains look quite healthy, or may be distinguished from the ripe fruits only by their dull green colour; but their whole interior is occupied by the spores of the Fungus, and, on being crushed, they are found to be greasy to the touch, and to emit a disagreeable smell. Under the microscope, the spores are seen to be globular, with a network of ridges over the surface. The diseased condition of the Wheat is known to farmers by the names "Bunt," "Stinking Rust," "Stinking Smut," or "Pepper-brand." On germinating, each spore emits a thread of mycelium, which bears on its tip a circle of slender conidia, united in pairs by cross-branches. The conidia fall, and produce mycelium, on which grow other conidia, from which mycelium is emitted; and on this the spores are formed. Several other species of *Tilletia* grow in the ovaries of grasses, *e.g.*, *T. Lolii* in *Lolium remotum*, *T. Secalis* in Rye (*Secale cereale*), &c.; while others form dark brown streaks in

Tilletia—*continued.*

the leaves of several grasses; *T. striæformis* is the commonest of the latter species. It has been asserted, but not confirmed, that the use of bunted meal causes disease.

Treatment. The infected grain may be steeped in solutions, *e.g.*, of 1 per cent. of carbolic acid in water, or of potassium permanganate, or of sodium sulphate; in the latter case, it should then be dusted with quicklime, and allowed to dry.

TIMMIA. A synonym of **Cyrtanthus** (which *see*).

TINANTIA (called after Tinant, a Belgian botanist). ORD. *Commelinaceæ.* A small genus (three species) of stove or hardy, erect herbs, natives of tropical America. Flowers pedicellate at the sides of the branches; cyme on a terminal peduncle. Leaves mediocre or ample. The under-mentioned plant is a half-hardy, perennial herb, closely allied to *Tradescantia.* It thrives in any well-drained, loamy soil. Seeds may be either sown in a warm, sunny spot in the open ground, in spring, or germinated in heat, and the seedlings hardened off and planted out; but it also thrives as a greenhouse plant.

T. fugax erecta (fugacious, erect). *fl.*, petals blue or purplish; pedicels conspicuously bracteolate at base; peduncle villous, one to three-parted at apex, the branches umbellate. July. *l.* ovate-lanceolate, pilose above, glabrous beneath, narrowed at base, slightly petiolate, longitudinally striated. Stem glabrous. *h.* 1½ft. 1794. SYNS. *Tradescantia erecta* (B. M. 1340), *T. latifolia* (L. B. C. 1300), *T. undata* (B. R. 1403).

TINEA (of Sprengel). A synonym of **Prockia** (which *see*).

TINEINA (from *tinea*, a clothes-moth). A very extensive division of small **Moths** (which *see*), most of which may be readily distinguished from the division **Tortricina** (which *see*) by the narrow wings, almost always fringed with long scales on the inner and hind margins, the hairless eyes, the thickened bases of the antennæ, and the upturned terminal joints of the palpi. They differ very greatly among themselves in form, colour, and habits, and even in size, some of the larger ones measuring nearly 1in. across the fore wings, while many of them do not exceed ¼in. across; in fact, the smallest known species of Moths belong to this division. The number of species is very great; and it is not possible to enter into details with regard to them individually. Hence, special reference must be confined to only a few of the species of most importance to horticulturists.

FIG. 40. SMALL ERMINE MOTH (*Hyponomeuta padella*). Twice natural size.

Most of the larvæ have six true legs, and ten suckers or prolegs; but in one genus there are twelve suckers, in others only eight, and in some the larvæ are entirely footless, and live in burrows in the leaves or other organs of plants. Some of the larvæ feed on the surface of the plants, exposed to view, or protected by a case fitting closely around the body. Most of them, however, live concealed, either in webs or in masses of flowers and seed vessels spun together, or, as already mentioned, in burrows in stems, leaves, or fruits; and some are but too well known because of their ravages on clothes, and on articles of furniture.

Among the genera most destructive in gardens is *Depressaria*, several species of which are hurtful to Carrots and Parsnips, and are described among the insect foes

Tineina—*continued.*

of these plants. Some of the species in this genus reach a span of nearly 1in. across the fore wings, and are thus among the largest of the *Tineina.* The genus *Tinea* includes a considerable number of species, several of which feed in clothes, in furniture, or on Cereals, &c., stored in granaries and warehouses; but none are conspicuously hurtful in gardens. An account of *Hyponomeuta padella*, and its ravages on Hawthorn, is given under **Hawthorn Caterpillars.** The genus *Hyponomeuta* includes a few species, all easily recognised by three or four longitudinal rows of black dots on the white or grey fore wings (see Fig. 40); but the larvæ of *H. padella* alone are ever seriously injurious in gardens. Their

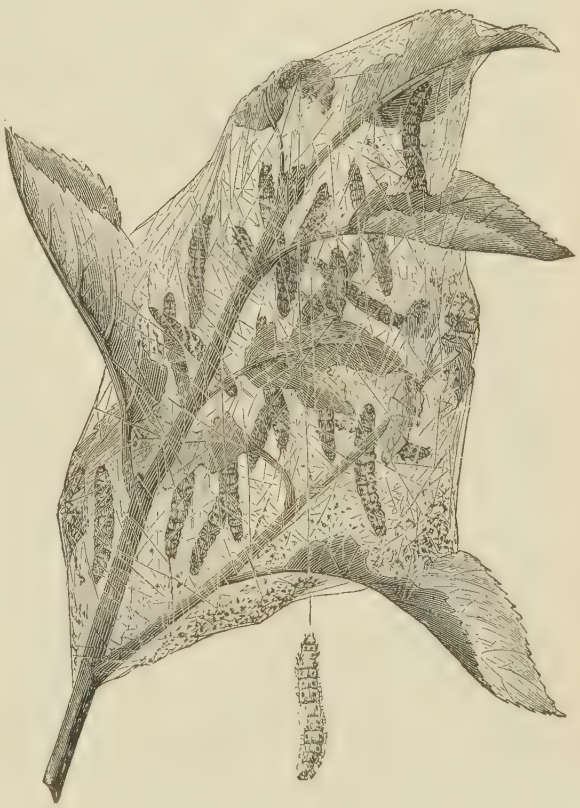

FIG. 41. LARVÆ AND WEB OF SMALL ERMINE MOTH (*Hyponomeuta padella*).

habit of living in society, in a web (see Fig. 41) renders them very conspicuous, and it is easy to remove and destroy entire colonies. **Plutella cruciferarum** (which *see*) does a good deal of harm to Cabbages and Turnips. *Endrosis fenestrella* is one of the most abundant of clothes-moths in houses, appearing almost throughout the year. It may be known by the snowy-white head and thorax, and dirty-grey wings, clouded with darker markings. The leaf-miners are very numerous; indeed, there are few trees or shrubs that are not infested by several, or even by many, species; and there are also many leaf-miners that burrow in the leaves of herbs of various kinds: *e.g.*, several live in *Epilobium angustifolium* and its congeners. The mines and blotches produced by these insects render the leaves unsightly, but are seldom so numerous as to materially weaken the plants.

Treatment. If the plants are suffering from the abundance of leaf-mining larvæ upon them, or if their beauty is

Tineina—*continued.*

materially impaired thereby, the mined leaves should be picked off with the larvæ still in them; or the larvæ may be crushed in the leaves between the finger and thumb. The habits of life of other injurious *Tineina* are so various that no general statement of treatment would be of much service, and reference should be made to the methods advised under the special headings quoted above.

TINNÆA (named in honour of Mdlle. Tinné, Nile voyager). ORD. *Labiatæ*. A small genus (four or five species) of tall, pubescent or woolly, stove herbs or undershrubs, natives of tropical Africa. Flowers fuscous- or violet-purple, fragrant; calyx ovoid, bilabiate; corolla tube short and broad, the limb sub-bilabiate, the upper lip emarginate or two-lobed, the lower one much longer and spreading; stamens four; whorls often loose, two-flowered, axillary or disposed in a terminal raceme; pedicels bibracteolate. Leaves entire; floral ones conformed, the upper ones reduced to bracts. Only one species has been introduced. It thrives in any light, rich soil. The plants should be grown in a light, airy place, and frequently pinched to induce a bushy growth. Propagation may be effected by cuttings, which root readily.

T. æthiopica (African).* *fl.* copiously produced in the upper axils, two or three to a peduncle; corolla dark maroon-purple, the broad tube a little longer than the calyx. Winter. *l.* on short, slender petioles, ovate, sub-acute or acute, quite entire, narrowed at base. Stems and branches erect, terete, ribbed, twiggy. *h.* 4ft. to 6ft. 1867. A hoary sub-shrub. (B. M. 5637.)

T. æ. dentata (toothed). *fl.*, calyx large, cylindrical, two-lipped, inclosing the whole of the corolla tube. *l.* opposite, elliptic, slightly toothed. 1884. (B. M. 6744.)

TINUS. Included under **Viburnum** (which *see*).

TIPULA. *See* **Tipulidæ.**

TIPULARIA (from *tipula*, a Daddy-long-legs; in allusion to the shape of the flower). SYNS. *Anthericlis*, *Plectrurus*. ORD. *Orchideæ*. A small genus (two closely-allied species) of terrestrial Orchids; one is North American, and the other Himalayan. Flowers rather small, loosely racemose, pedicellate; sepals and petals free, narrow; lip sessile, with small lateral lobes and a flat middle one. Leaves ovate. The species have no horticultural value.

TIPULIDÆ. A family of two-winged flies (*Diptera*) distinguished by the long, slender body, with long, unarmed legs, and long, rather narrow wings, with many veins. There is a distinct furrow on the back of the thorax, between its front and middle segments. The head is usually rather small and round, and bears rather long antennæ, which have from six to nineteen joints. One of the commonest species, the Common Crane Fly

FIG. 42. TIPULA OLERACEA.

(*Tipula oleracea*), is shown, of the natural size, at Fig. 42. The larvæ of *Tipulidæ* are popularly known as "grubs," and under that name are but too well known to farmers, as they are among the worst enemies of the cultivated crops, and of pastures. They are dirty-grey,

Tipulidæ—*continued.*

cylindrical maggots, with no distinct head or feet. The rings are separated by shallow grooves. The body is blunt behind, but bears six small, fleshy tubercles on the blunt end. The "grubs" are clumsy creatures, and move slowly, but are protected from injury by their tough skin, which has procured them the name of "Leather-jackets" in some localities. They are of various sizes, when full grown, as there are numerous species. The larvæ of *T. oleracea* reach a length of over 1in., with a thickness of about $\frac{1}{5}$in. They live in the soil, a little way below the surface, feeding on the roots of grasses and other plants. When numerous, they not unfrequently destroy the grasses on lawns, or devour great part of the garden and field crops. The produce of damp soil is peculiarly apt to suffer from their ravages. When full fed, they change into pupæ, which are of nearly the same size as the larvæ, but are provided with cases on the front part of the body for the wings and legs of the future Crane Fly. The rings of the abdomen of the pupæ each bear a transverse row of short, stiff spines; and, by means of these, the pupæ can wriggle partly out of the soil, just before the flies are ready to break out, to permit their more easy exit. There are many species of *Tipula*, but there is no need to describe them in detail, as all show much the same habits, and must be combated by the same methods.

Treatment. The female flies are prevented from laying eggs, and the larvæ may be destroyed, by the employment of dressings of such materials as gas lime or soaper's ashes. Common salt has also been found useful, in the proportion of about half a ton to the acre, just before the ground is ploughed. Deep ploughing is very beneficial. To enable the crops to resist attacks, the most effectual method is to stimulate growth by dressings of guano or other manures, so as to render the plants less liable to serious injury, even if partially eaten. The use of heavy rollers has been recommended for lawns, and this would probably kill those grubs that lie close to the surface; but they are not very liable to injury from pressure, unless it is very considerable.

Traps, as recommended under **Crane Fly** (which *see*), consisting of slices of turnip, potato, or other fleshy roots or tubers, may be employed with success for the protection of choice plants or crops. They should be sunk a few inches below the surface of the soil, and be examined every two or three days, the grubs found in them being removed and destroyed.

Certain birds, especially starlings and rooks, are very useful in reducing the number of grubs, of which they eat multitudes: they ought, therefore, to be encouraged. Among the most productive breeding-grounds of grubs (as well as of other pests of gardening and of agriculture) are uncultivated corners or edges of shrubberies and fields, where weeds are allowed to grow unchecked from year to year. It is advisable to get rid, as thoroughly as possible, of such sources of trouble.

TISSUE. The material of which the elementary organs of plants are constructed, whether consisting of membranes, bladders, cells, or fibres.

TITHONIA (a name of mythological derivation, from Tithonus, the favourite of Aurora). ORD. *Compositæ*. A small genus (four or five species) of half-hardy, robust, annual herbs, or sometimes shrubby at base, natives of Mexico, Central America, and Cuba. Flower-heads yellow, large, heterogamous, on long, thickened peduncles; ray florets ligulate, spreading, entire or scarcely bidenticulate; involucre hemispherical or broadly campanulate, the bracts biseriate; receptacle convex; achenes slightly pilose. Leaves alternate, petiolate, entire or three-lobed. The species here described thrive in any light soil. Propagated by seeds.

Tithonia—*continued.*

T. ovata (ovate). A synonym of *Zexmenia ovata.*

T. speciosa (showy). *fl.-heads,* involucral bracts leafy; ray florets about twelve or thirteen, rich red; peduncles one-headed, thickened above. August. *l.* petiolate, cordate, undivided or crenately three-lobed. Stem erect, terete. *h.* 4ft. Mexico, 1833. SYN. *Helianthus speciosus* (B. M. 3295).

T. tagetiflora (Marigold-flowered). *fl.-heads* orange-yellow; ray florets oval-oblong; involucre velvety, erect; peduncles thickened at apex. August. *l.* usually trilobed. *h.* 6ft. Vera Cruz, 1818. (B. R. 591; R. H. 1858, f. 64.)

T. tubæformis (tube-like). *fl.-heads,* ray florets oblong; involucre hairy, somewhat spreading; achenes usually biaristate; peduncles thickened at apex. July. *l.* all undivided. *h.* 5ft. Mexico, 1799. (B. R. 1519, under name of *Helianthus tubæformis.*)

TITHYMALUS. A synonym of **Euphorbia** (which *see*).

TITRAGYNE. A synonym of **Rohdea** (which *see*).

TITTMANNIA (of Reichenbach). Included under **Vandellia** (which *see*).

TOAD (*Bufo vulgaris*). There are few more useful animals in a garden than the common Toad, despite the prejudices with which it has so long been regarded, and which are, even yet, hardly extinct in some minds. It is, however, scarcely necessary, in the present day, to waste words to disprove the belief, so widely prevalent in the past, that the Toad is venomous. It is perfectly harmless to human beings. It is of much value in a garden, from the fact that it feeds largely on insects and slugs. During the day, Toads shelter themselves under stones, or in holes in the soil; or, in default of these, they will retreat to the shade of broad-leaved plants. The night is their time for movement and for taking food; though a dull, wet day will also tempt them out. Despite the slowness of their motions, they are able to capture the most active insects. This is done by means of the tongue, which can be shot forth from the mouth to a surprising distance.

TOADFLAX. *See* **Linaria.**

TOAD FLOWER, AFRICAN. A common name for several species of *Stapelia.*

TOAD STOOL. A common name for poisonous Fungi.

TOBACCO. *See* **Nicotiana Tabacum.**

TOCOCA (*Tococo* is the name of *T. guianensis* in Guiana). Including *Sphærogyne.* ORD. *Melastomaceæ.* A genus comprising about thirty species of glabrous or hispid-pilose, stove shrubs, natives of North Brazil, Venezuela, and Guiana. Flowers white or pink, rather large, paniculate, naked or included in ample bracts; calyx tube terete or costate, the limb dilated, five or six-lobed; petals five or six, obovate or oblong, obtuse or retuse; stamens ten or twelve, equal. Leaves petiolate, ample, membranous, rarely coriaceous, entire or denticulated, five-nerved, often having on the base or on the petiole a two-lobed, inflated bladder. The species known to cultivation are here described. They thrive in a compost of one part sandy loam and two parts rough peat. Cuttings of side shoots should be inserted in February.

T. ferruginea (rusty). *l.* three-ribbed, elliptic-oblong, shortly acuminate, shaded green on the upper surface, paler beneath, the younger ones stained with red. Stem terete, clothed with cinnamon-coloured scurf. South America, 1868. SYN. *Sphærogyne ferruginea.*

T. guianensis (Guiana). *fl.* shortly pedicellate or sessile; calyx limb entire; petals whitish-pink, obovate-cordate, inequilateral; panicle terminal. August and September. *l.* very variable in size and shape; broadly elliptic or ovate, shortly acuminate, rounded at base, very slightly denticulated; petioles scarcely ¼in. long beneath the bladder. *h.* 3ft. to 4ft. Guiana, 1826.

T. imperialis (imperial). *l.* large, elliptic, of a rich dark green, having a silky or velvety surface, and with the principal veins

Tococa—*continued.*

reddish at the base. Peru, 1869. A very handsome plant. SYN. *Sphærogyne imperialis.*

T. latifolia (broad-leaved). *fl.* very shortly pedicellate; petals of a beautiful pink or red; panicle terminal, more or less contracted, the branches slender. *l.* long-petiolate, broadly ovate, apiculate, entire or inconspicuously dentate-ciliated below the apex, rounded at base. Stem simple. Equinoctial America, 1862. SYN. *Sphærogyne latifolia.*

TOCOYENA (said to be the name of this plant in Guiana). SYN. *Ucriana.* ORD. *Rubiaceæ.* A genus comprising about eight species of erect, glabrous or tomentose, stove shrubs, natives of Brazil and Guiana. Flowers white or yellow, showy, cymose, sub-sessile; calyx five-toothed, persistent; corolla funnel-shaped, the tube slender, the throat naked; limb of five spreading, obtuse, contorted lobes; stamens five, inserted in the throat of the corolla; peduncles short and thick. Berry oblong, many-seeded. Leaves opposite or nearly so, shortly petiolate, ovate or lanceolate; stipules small, acute. *T. longiflora,* the only species known to cultivation, thrives in fibry peat, with the addition of a little lumpy loam, sand, and charcoal. It may be multiplied by cuttings of half-ripened shoots, inserted in sand, under a glass, in heat, during May.

T. longiflora (long-flowered). *fl.* sub-sessile, aggregated; calyx tube turbinate; corolla 8in. to 9in. long, the tube yellow, the limb white. *l.* lanceolate-oblong, acuminate at both ends, glabrous, 1ft. long, 4in. to 5in. broad; stipules triangular. Stem tetragonal, very simple. *h.* 6ft. Guiana, 1826. (A. G. 50.)

TODAROA (commemorative name). *Campylocentron* is now the correct name. ORD. *Orchideæ.* A genus comprising about fifteen species of stove, epiphytal Orchids, natives of tropical America. Flowers minute, spicate, often distichous; sepals and petals free, narrow; lip sessile at the base of the column, produced in a spur at base; column very short. Leaves distichous, often scattered, oblong, linear, or terete. Stem occasionally leafless, not pseudo-bulbous. Only one species calls for description here. For culture, *see* **Angræcum.**

T. micranthum (small-flowered). *fl.* white; sepals and petals spreading at apex; lip conformed, bilobed; spur obtuse, incurved; spike secund, many-flowered, horizontal, shorter than the leaves. February. *l.* 1½in. long, oblong, three-nerved, oblique at apex. Stem short. 1836. (B. R. 1772, under name of *Angræcum micranthum.*)

TODDALIA (*Kaka Toddali* is the Malabar name of *T. aculeata*). Including *Scopolia* (of Smith), *Vepris.* ORD. *Rutaceæ.* A small genus (six to eight species) of unarmed or prickly, climbing or sarmentose, stove shrubs, dispersed over the tropics of the Old World and the Cape. Flowers in axillary or terminal cymes or panicles; calyx short, two to five-toothed, lobed, or parted; petals two to five, imbricated or valvate; torus inconspicuous or slightly elongated. Leaves alternate, trifoliolate; leaflets sessile, lanceolate, coriaceous, entire or crenate, pellucid-dotted. Three species have been introduced, all natives of Mauritius. They are interesting shrubs, thriving in a compost of loam, peat, and sand. Propagated readily by cuttings, inserted in sand, under a glass, in heat.

T. aculeata (prickly). Lopez Root. *fl.* white; panicles shorter than the leaves, pilose, many-flowered. May. *l.*, leaflets oblanceolate-oblong, acute, ½in. to 1in. broad, entire or obscurely crenate, the edges wrinkled; petioles 1in. long, flattened upwards. 1790. A climber, often armed with hooked prickles. (B. M. Pl. 49.)

T. lanceolata (lance-shaped). *fl.* white, on short pedicels; panicles many-flowered, axillary and terminal, thyrsoid. May. *l.*, leaflets oblong-lanceolate, 2in. to 3in. long, acute, entire, the edges waved; petioles 1in. to 2in. long, not flattened. *h.* 4ft. and upwards. 1824. An erect shrub. SYN. *Vepris lanceolata.*

T. paniculata (panicled). *fl.* greenish-white, in copious, deltoid, terminal panicles, with spreading or ascending branches. May. *l.*, leaflets obovate-oblong, obtuse or sub-acute, 1in. to 1½in. broad, bright green; petioles 1in. to 1½in. long, sub-terete. *h.* 20ft. to 30ft. 1824. An erect, unarmed shrub.

TODDY PALM. A common name for **Caryota urens** (which *see*).

TODEA (named in honour of Henry Julius Tode, of Mecklenburg, 1733-1797, an experienced mycologist). Crape Fern. Including *Leptopteris* (of Presl). ORD. *Filices.* A genus comprising about five species of greenhouse Ferns, almost confined to the South temperate zone, having the capsules of *Osmunda*, but the ordinary habit of *Polypodium.* Sori on the back of the leafy part of the frond. Todeas thrive in the cool house, and prove very ornamental if planted in moist, sheltered places in the open fernery. If rapid growth be desired, the plants should be grown in the tropical fernery, in a close case. The best soil is one composed of fibrous peat and silver sand. Ample shade must be afforded, and the fronds frequently moistened by sprinklings of water. *See also* **Ferns.**

T. africana (African). A synonym of *T. barbara.*

FIG. 43. PORTION OF FROND, WITH BARREN AND FERTILE PINNÆ, OF TODEA BARBARA.

T. barbara (Barbary).* *cau.* sub-arborescent. *sti.* 1ft. or more long, stout, erect, quadrangular, quite naked. *fronds* 3ft. to 4ft. long, often 1ft. broad; pinnæ close, erecto-patent, 1in. to 1½in. long, ⅛in. to ¼in. broad, the edge more or less distinctly toothed, the upper ones connected at the base. *sori* dense, when mature filling up the whole under surface of the pinnules on which they are placed. Australia and New Zealand, 1869. See Fig. 43. (B. M. 5984.) SYNS. *T. africana, T. rivularis.*

Todea—*continued.*

12in. broad, tripinnatifid; pinnæ close, lanceolate, 4in. to 6in. long, ⅜in. to 1½in. broad, the rachis winged only towards the apex, the lowest about equal to the others; pinnules close, linear-

FIG. 45. TODEA SUPERBA.

oblong, ⅛in. to ⅜in. long, ¼in. broad, cut down nearly to the rachis into erecto-patent, simple or forked, linear segments; rachises naked or slightly tomentose. New Zealand. See Fig. 44. (H. G. F. 54.) SYN. *T. pellucida.*

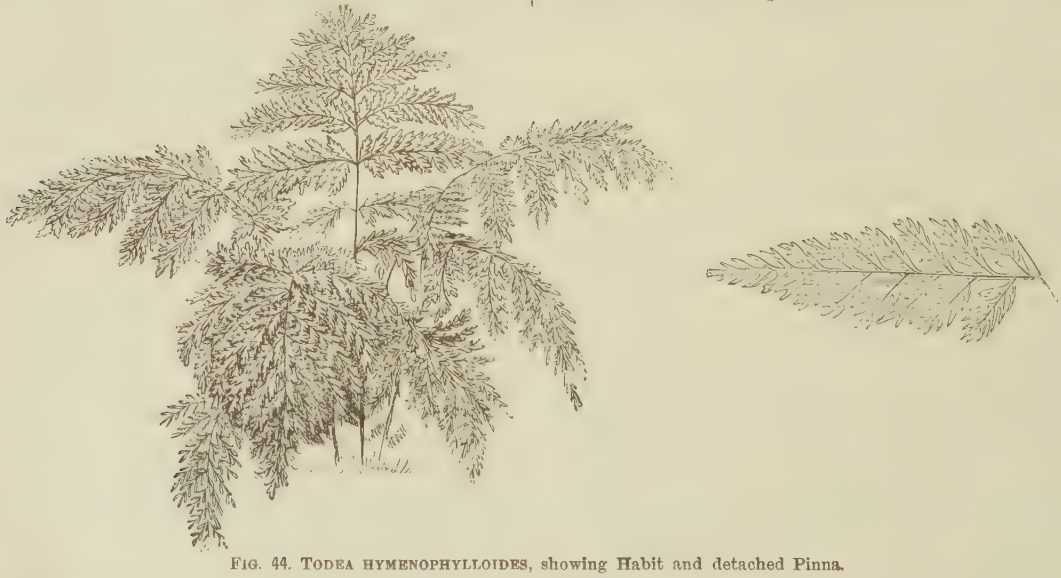

FIG. 44. TODEA HYMENOPHYLLOIDES, showing Habit and detached Pinna.

T. Fraseri (Fraser's). *cau.* erect, woody, 1½ft. to 2ft. high, 1½in. to 2in. thick. *sti.* 6in. to 9in. long, firm, erect, naked. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, bipinnate; pinnæ close, lanceolate, 4in. to 6in. long, ⅜in. to ⅝in. broad, with a narrowly-winged rachis, the lowest about equal to the others; pinnules linear-oblong, ⅛in. long, ⅛in. to ¼in. broad, sharply toothed, the rachises naked. Australia, 1861. SYN. *Leptopteris Fraseri.*

T. F. Wilkesiana (Wilkes'). *fronds* larger than in the type; lower pinnæ rather shorter than the others, and deflexed; rachises slightly pilose. Fiji and New Hebrides, 1870.

T. hymenophylloides (Hymenophyllum-like).* *sti.* tufted, 6in. to 12in. long, firm, erect, naked. *fronds* 1ft. to 2ft. long, 8in. to

T. h. compacta (compact). A variety far closer and denser in form than the type.

T. pellucida (pellucid). A synonym of *T. hymenophylloides.*

T. rivularis (brook-loving). A synonym of *T. barbara.*

T. superba (superb).* *cau.* erect, woody, 1ft. to 1½ft. high *sti.* 2in. to 3in. long, firm, erect, naked. *fronds* 2ft. to 4ft. long, 6in. to 10in. broad, tripinnatifid; pinnæ close, narrow-lanceolate, the central ones 4in. to 5in. long, ⅜in. broad, the lower ones gradually reduced; pinnules close, linear-oblong, ⅛in. to ⅜in. long, cut down nearly to the rachis into erecto-patent, simple or forked, linear segments; rachises densely tomentose. New Zealand, 1861. A splendid plant for exhibition purposes. See Fig. 45.

TOFIELDIA (named in honour of Tofield, a Yorkshire botanist). False Asphodel. SYNS. *Hebelia, Heriteria.* ORD. *Liliaceæ.* A genus comprising about fourteen species of mostly hardy, perennial herbs; two are natives of the Andes, and the rest are broadly dispersed over mountainous and temperate regions. Flowers small, shortly pedicellate or sub-sessile, in terminal spikes; perianth persistent, the segments distinct or very shortly connate near the base; stamens six. Leaves radical or clustered at the base of the stem, short-linear, subdistichous; cauline ones few or none. *T. palustris* is a native of Britain, but of no particular beauty. *T. pubens*, the only species calling for mention here, thrives in any light soil, in a moist situation. It may be increased by division of the roots.

T. pubens (downy). *fl.*, perianth whitish, two lines long, raceme loose, 2in. to 4in. long. July. *l.* radical, narrow-linear, somewhat rigid, glabrous, 6in. to 12in. long. Stem slender, 1ft. to 2ft. high. North America, 1840. (B. M. 3859.)

TOLMIEA (dedicated by Torrey and Gray to Mr. Tolmie, surgeon of the Hudson's Bay Company at Puget Sound). ORD. *Saxifrageæ.* A monotypic genus. The species is a hardy herb, with a perennial rhizome. It was formerly included under **Tiarella** (which *see* for culture).

T. Menziesii (Menzies'). *fl.* greenish, rather large, nodding, in a slender, elongated raceme; calyx purple-nerved; petals five, capillary. April. *l.*, radical ones petiolate, alternate, incised-lobed; cauline ones alternate. Stem 1ft. to 2ft. high, three to five-leaved, hairy. North-west America, 1812. SYNS. *Heuchera Menziesii, Tiarella Menziesii* (H. F. B. A. i. 80).

TOLPIS (a name given by Adanson, probably without meaning, as was his custom). ORD. *Compositæ.* A genus comprising less than eighteen species of pretty, hardy, annual or perennial herbs, rarely with a slightly woody caudex, natives of the Mediterranean region and the Canary Islands. Flower-heads pale or bright yellow, homogamous; ray florets truncately five-toothed at apex; involucre campanulate; bracts narrow, the lower ones one or two-seriate, the upper ones in many series; receptacle naked or honeycomb-like. Leaves mostly radical, or alternate on the lower part of the stem, entire, toothed, or pinnatifid, the upper ones often narrow. The following species, which are those best known to cultivation, are well suited for the ornamentation of flower borders, where the seed may be sown in spring. All flower in June.

T. altissima (very tall). A synonym of *T. virgata.*

T. barbata (bearded). Yellow Garden Hawk Weed. *fl.-heads*, involucre slightly farinose, the outer scales subulate-falcate. *l.* lanceolate, toothed. Stems erect, branched, leafy. South Europe, &c. SYN. *Crepis barbata* (B. M. 35).

T. macrorhiza (large-rhizomed). *fl.-heads* nearly as large as those of *T. barbata*, disposed in an ample panicle; involucre farinose-pubescent; pappus of fifteen to twenty bristles; pedicels squamellose. *l.* undivided, oblong, toothed, sessile, slightly fleshy-coriaceous. Stems shrubby, branched; root thick, fleshy. Madeira. Plant highly glabrous. SYN. *Crepis macrorhiza* (B. M. 2988).

T. umbellata (umbel-flowered). *fl.-heads* pale yellow, one-half smaller than those of *T. barbata*; peduncles tomentose at apex. *l.* oblong-linear, toothed; upper ones entire. Stems erect, branched, nearly naked. *h.* 2ft. South Europe, 1820.

T. virgata (twiggy). *fl.-heads* small; pappus of six to ten bristles; involucre and pedicels farinose-pubescent. *l.* elongated, linear-lanceolate, toothed; upper ones linear, entire. Stem erect, branched, glabrous. *h.* 3ft. South Europe, &c., 1823. SYN. *T. altissima.*

T. v. grandiflora (large-flowered). *fl.-heads* citron-colour; involucre mealy, the outer scales short and subulate. *l.* radical, lanceolate, toothed, sparsely hairy, densely villous towards the base. South Italy, Sicily, &c., 1830.

TOLU BALSAM-TREE. *See* **Myroxylon Toluiferum.**

TOLUIFERA. A synonym of **Myroxylon** (which *see*).

TOMATO (*Lycopersicum esculentum*). A tender annual, native of South America, cultivated for the use of its fruit for cooking as a vegetable, as an ingredient

Tomato—*continued.*

in salads, for making Tomato sauce, and for various other culinary purposes. The fruits are sometimes used in a green, but more generally in a ripe, state. In most gardens of extent, the Tomato is considered one of the most important vegetables grown, and the keeping of a continued supply, if possible, throughout the whole year, is a point to be specially aimed at. For marketing, Tomatoes are very extensively cultivated, as they invariably command a good price, except, perhaps, for a limited period when the general crop is being harvested at the end of summer. The annual supply grown in this country for market purposes is nothing like equal to the demand, and large quantities of fruits are imported. Of late years, a considerable number of establishments have sprung into existence in which Tomatoes are cultivated (planted out) under glass on a vast scale; and while the demand for their produce is good, and more likely to increase than diminish, it proves, as a rule, a remunerative undertaking, and one which promises to continue so. In this country, it is only in warm situations, and in favourable localities, that the Tomato crop can be depended upon in the open air, though much depends on the season — whether it be a hot and dry, or a cold and wet one — and the strength of the plants when placed outside. Plants raised under glass, and grown to a good size, large enough to begin flowering, or even setting fruit, before being put out into their permanent quarters, have a manifest advantage over others which are not so prepared, in perfecting a crop afterwards. Indoors, Tomatoes may be grown to bear freely in large pots or boxes, or they may be planted in a ridge of soil, and trained to a trellis, or nailed against the back wall of a melon or cucumber house, provided there is sufficient light.

Tomatoes may be increased in any quantity from seeds, which ripen in abundance in most of the fruits that reach maturity; or they may be raised from cuttings, which is sometimes an advantage, as these root readily in heat, and soon grow to a fruiting size. Seeds intended for raising plants for the open air should be sown at the end of February, or during March, in 5in. pots, or in shallow pans, filled with light soil, and placed in a temperature of 55deg. or 60deg., either in a heated structure, or on a hotbed. As the seedlings come up, they must be kept well exposed to light, to prevent them becoming drawn. When the second leaves appear, they should be potted off singly, and still kept in heat, until re-established, when they may be grown on in any light house or frame, with more air, until gradually they are hardened off for placing outside, towards the end of May, or early in June. If placed singly, at first, in 3in. pots, the plants may be readily shifted into others, 6in. in diameter, some time during April, and this will be sufficiently large for them. Some growers place two plants in a pot, opposite each other, and close to the edge, and then divide the ball when planting out; but it is obvious that this must injure the roots, although, if they are not very much crowded, and due attention is given to watering and, if necessary, shading, for a few days, new growth is soon commenced. As our ordinary summers are not long-lasting, it is most important that the plants be thus forwarded, and special attention given them in training, to induce a fruitful, instead of a too luxuriant, growth. This may best be done by keeping the side shoots pinched out, and limiting each plant to the centre one only, or, at most, to not more than two. Treated in this way, the clusters of flowers which will appear before the plants get up very much will be strong, and — what is of equal or more importance — they will be swelling off at the earliest possible moment. Early ripening, or management with a view to attaining it, is quite a necessity, as it is of little use only having heavy crops at a time when they cannot ripen for want

Tomato—*continued.*

of sun. The best place for Tomatoes outside is a warm south wall; there are generally spaces in such positions, unoccupied by fruit-trees, which cannot be more profitably furnished. Select the places, and add a few spits of turfy soil round each plant when inserting it. The after-treatment consists in keeping the leading shoots tacked up as they lengthen, and in pinching off all the side ones rather frequently—say, once a fortnight—if there are any formed. In dry weather, water should be plentifully given if the plants appear to be in want; but a mulching of loose, leafy manure or litter will, if applied, be of material advantage in preventing this. Fruits, when they commence colouring, should be fully exposed to the sun; this can be done by fastening to one side, shortening, or removing altogether, some of the leaves which prevent the direct exposure to sunlight. When there is danger of frost, any green fruits may be cut and placed on a shelf in a warm house or vinery—if it is kept rather dry, so much the better—where many of the most forward ones will ripen. The plants, and also any part of the crop that is left out, are soon destroyed by frost.

Tomato culture outside, in market gardens, has of necessity to be conducted on a different system, as there are no south walls as in private gardens. The plants are raised in frames, filled with fermenting manure, in early spring, and grown on as sturdy as possible, by allowing them plenty of air on all favourable occasions. Towards the end of May, they are thoroughly hardened off by removing the sashes daily; afterwards, they are planted in one of the most favourable warm positions at command, and still protected until all danger from frost is past. Large Red and Conqueror are two of the most profitable varieties for outside culture, either in private or other establishments: they fruit freely, and the produce is large and ripens well, provided the conditions under which the plants are placed are such as suit Tomatoes outside.

When grown in the open ground, the plants may be trained to strong stakes about 4ft. high, and the side shoots kept well thinned, to allow all the strength to pass into the fruits situated on the main. Where there is lack of wall space, this method of planting may be adopted in any garden; the plants must be strong and well hardened off before putting them out, and the position given them should be well sheltered and one of the warmest at command: a south border is most desirable.

Under glass, and with sufficient heat and space at command, Tomatoes may be had in greater or less quantity all the year round. During summer, when the supply is but uncertain from outside plants, it is always advisable to have some additional plants fruiting indoors, and from these the produce is also superior, because better ripened. The plants may be grown in large pots or deep boxes, or they may be planted out in a narrow bed formed with loose bricks to allow an inside space of about 2ft. Plenty of light is essential; consequently, a span-roofed house is best adapted, although a lean-to answers admirably. Plants raised from cuttings are generally preferred, as they are considered to begin bearing earlier, and are sometimes less vigorous than seedlings, which is an advantage in a limited space; but either plan of propagating may be adopted. Cuttings root very readily, if kept close, anywhere in heat, and either spring or the latter part of summer is the best time for renewing the stock. Young plants bear best, and, as they can be so easily raised, it is preferable to replace old ones rather than keep them after the produce begins deteriorating in size and quality. Ripe Tomatoes are most valued if procurable during the winter and in early spring; the plants intended for bearing at these seasons are, therefore, of much importance. Cuttings, struck in August, in small, single pots, should be

Tomato—*continued.*

grown on and shifted into larger ones as becomes necessary, until a 10in. or 12in. size is reached, which will be sufficiently large for fruiting them in if pot culture is adopted. Even when it is intended to plant in narrow borders or in boxes for fruiting, the plants may first be grown in pots and transferred to their permanent quarters when some of the earlier fruits are set. The mode of training should be that of keeping either to a single stem, or to two main shoots, all side ones being kept removed from the first. These shoots should be supported, from an early stage, with a stake; and a wire trellis, fixed about 9in. or 12in. from the glass, is best to train to afterwards. To get two shoots formed of about equal strength, the plants should be pinched once when from 6in. to 9in. high; and to encourage the production of heavy crops, the extreme points may be taken out after each bunch of fruits shows: new leaders will form readily, and generally additional fruits will appear at their first joints; hence the productiveness at an early stage, and in a small space, secured by this mode of training. This frequent stopping is not a necessity where there is plenty of space for the plant to grow: it will invariably show far more flowers than can be perfected, if the variety is a productive one. When sufficient are set for a crop, the others which appear may be pinched off. To succeed autumn-raised plants, others should be propagated in February, and grown on in pots preparatory to being placed in permanent positions. A night temperature in winter of 55deg. to 60deg., with a rise of 5deg. by day, is not too high for Tomatoes. They need a somewhat similar temperature to winter Cucumbers, with which they are sometimes grown in the same house. If but an occasional dish of ripe fruits can be secured in winter, they are generally much valued; through the dullest season the ripening process goes on but slowly. Throughout the summer, Tomatoes may be grown in almost any glass structure, or in slightly-heated pits and frames, after the latter are cleared of bedding plants, &c., for the season; and the crops thereby obtained are more certain to ripen than those on plants outside, although in private gardens, where a quantity is required, both modes of culture are recommended.

Tomatoes need an ample supply of water at all times, particularly when growing in pots or in any limited space. A rough, turfy compost, with a little decayed manure intermixed, will suit them; it is preferable to give manure water, or one of the concentrated artificial manures, when the fruits begin swelling, than to give a very rich compost previously, which would tend to induce too vigorous a growth—perhaps at the expense of productiveness.

Fungi. Tomatoes frequently suffer greatly from the attacks of the Potato-disease Fungus. *See* **Phytophthora** for an account of this parasite, and of the means to be employed against it.

Insects. Tomato-plants are seldom very seriously injured by insects; but in the course of the year 1886 a species of *Aleyrodes* (*see* **Snowy Fly**) proved very destructive, in several localities, to plants in greenhouses, and more especially to Tomato and Cucumber-plants. The species now in question was named *A. vaporariorum*, and figured, by Prof. Westwood, in 1856. The larvæ feed on the backs of the leaves, piercing the skin and sucking the juices, like the more common *A. proletella* on Cabbages. The pupæ are also fixed to the leaves; and the perfect insects emerge after a few days spent in the pupal stage. The insects differ from *A. proletella* in having milk-white, unspotted wings and pale yellow bodies. The leaves occupied by them turn yellow, wither, and die. These insects are unable to withstand exposure to the open-air temperature of England; and are supposed to have been brought from Central America or Mexico, with plants of some sort.

Tomato—*continued.*

They have been found on the Continent of Europe, on a large variety of trees and shrubs.

Remedies. The remedies employed should be the same as those found to give good results against **Aphides** (which *see*), which these insects greatly resemble in their habits.

SORTS. Of the somewhat numerous sorts of Tomatoes in cultivation, the subjoined is a selection. For general purposes it is immaterial whether the fruits are smooth,

FIG. 46. RIBBED FRUITS OF TOMATO.

or ribbed, as represented in Fig. 46; but there are many occasions when those of even outline and medium size are specially asked for. It is, therefore, advisable to grow at least one of the smooth kinds.

Acme. Fruit purplish-crimson, handsome, smooth in outline, very distinct in colour. Plant prolific.

Chiswick Red. Fruit bright scarlet, egg-shaped, borne in large clusters. Exceedingly productive, and of good quality.

Conqueror. Fruit vermilion-red, large, handsome, of excellent quality. Early, and one of the best for outdoor culture.

Dedham Favourite. Fruit rich ruby-red, of large size, quite smooth. Productive, and good for exhibition.

Greengage. Fruit of a beautiful citron-yellow colour, when ripe, produced in clusters. The best yellow-fruited variety; very distinct and ornamental.

Hackwood Park Prolific. Fruit scarlet, large, smooth, even in form and size, borne in large clusters. Early, and exceedingly productive.

Hathaway's Excelsior. Fruit fine red, handsome, very smooth and even in outline, firm, and of excellent quality. One of the best.

Large Red. Fruit deep scarlet, very large, flattened and ribbed. Very productive, and well adapted for outside culture.

Orangefield Dwarf. Fruit red, large, frequently much ribbed, of excellent flavour. Plant unusually dwarf, early, and an abundant bearer; one of the best for indoor culture in a limited space and during winter.

Pear-shaped. Fruit red, pear-shaped, very distinct, produced freely in clusters. This variety is ornamental, but not very extensively cultivated.

Stamfordian. Fruit red, smooth, very large, somewhat in the way of TROPHY. Fine for exhibition.

Trophy. Fruit red, exceedingly large and nearly smooth. Productive, but rather late.

CHERRY AND RED CURRANT TOMATOES. These are chiefly grown for ornament, as their fruits are borne in great profusion in bunches or clusters. They represent, in general appearance, the Cherry and Red Currant, after which they are popularly called.

TOMATO, CANNIBAL'S. *See* **Solanum anthropophagorum.**

TOMENTOSE. Covered with tomentum.

TOMENTUM. Dense, rather short, rigid hairs, which are sensibly perceptible to the touch.

TOMEX. Included under *Litsea.*

TOMICIDÆ. A name occasionally employed for the family of Beetles now called **Scolytidæ** (which *see*). The name is taken from *Tomicus*, one of the chief genera in the family.

TONGA-PLANT. *See* **Epipremnum mirabile.**

TONGUE-GRAFTING. Another name applied to Grafting by the whip or splice method—that most generally practised in this country, and with the greatest success when stock and scion are both small and of about an equal size. When preparing the two surfaces that are to fit

Tongue-Grafting—*continued.*

together, a small, thin tongue is cut in an upward direction in the scion, and also a notch the opposite way in the stock, corresponding in size as near as can be judged. In fitting the two together, the notch may be kept open with a knife, and the tongue should be carefully inserted. It acts as a great support to the scion, and materially aids in keeping the latter in position while the bandage is put on, and until the parts unite. By cutting a tongue in this way, and fitting it properly, there are also additional surfaces that may grow together and render the union still more complete. *See also* **Grafting.**

TONGUE GRASS. A common name for **Lepidium sativum** (which *see*).

TONIC. Bracing; corroborative.

TONNINGIA. A synonym of **Cyanotis** (which *see*).

TONQUIN BEAN. *See* **Dipterix odorata.**

TONSELLA. Included under *Salacia.*

TONTANEA. A synonym of **Coccocypselum** (which *see*).

TONTELEA. Included under *Salacia.*

TOOLS, IMPLEMENTS, &c. For gardening purposes, it is customary to provide Tools of all descriptions used in carrying out all kinds of work. On their description and quality depend materially the amount of work that may be accomplished, and also the manner in which it is done; workmen generally do more with good and useful Tools that are always kept clean, than if they had to use others, indifferent in quality and make, or rusted because of being subjected to wet weather or taken in dirty, and neglected while temporarily stored away. This latter is, unfortunately, a too frequent occurrence, sometimes arising from disinterestedness on the part of workmen: the defect might be cured by the adoption of a simple rule by those in charge, which should be applicable to all who use anything from the Tool-shed. Some of the Tools used in gardens are requisite in all establishments, whether conducted on a large or small scale, as, for instance, the spade; this is indispensable at all seasons. It may, therefore, be taken as an example in referring to the importance of having Tools of good quality, even if at a little more expense at first. Inferior articles are most unprofitable, no matter of what description. Tools also need proper usage and to be kept clean. The first of these remarks is commended to the attention and judgment of persons who have to buy or procure Tools; the second to those whose lot it is to subject them to daily or occasional use.

In the subjoined general notes on Tools, Implements, &c., reference is made to requisites which should be found in establishments where gardening work of the ordinary routine is carried out. The extent of a place, and the number of workmen employed, must necessarily be the guide for quantity: no general scheme is applicable. It might seem unnecessary to make reference to what is apparently so familiar in relation to Tools in daily use; but those best known are the most essential, and must therefore be noticed, while many others which are only occasionally required, are none the less requisite, and should therefore be ready at hand.

Averruncator. One of these is most useful in gardens where there are extensive grounds attached, with tall-growing shrubs, standard trees, &c., that need pruning at a considerable height above ground, and yet cannot conveniently be reached by means of a ladder or steps. The Averruncator consists of a hooked blade, which is fixed into the end of a handle, made ready for use in one length, or sometimes in two, with provision for joining them together when requisite. To the fixed hooked blade, another blade with a semicircular cutting

Tools, Implements, &c.—*continued.*

edge is attached, generally riveted; this has a lever, with a cord tied to the end, so that, when the cord is pulled from below, the two blades close, and sever branches—if the wood is not too hard—of nearly, or quite, 1in. in diameter. A spring, which is fastened to the fixed, and also to the lever, blades, separates their cutting edges so soon as the rope is loosened. For pruning or cutting into shape tall trees and shrubs at considerable elevations, this is the most effectual plan, as a workman may stand on the ground, and easily detach branches situated at a height of from 12ft. to 16ft., provided, of course, that the handle is sufficiently long. The cord passes from the lever over a small pulley fixed to the handle, and thus full purchase is secured.

Axe. A small, short-handled Axe is adapted for cleaving blocks of firewood, after they have been sawn into proper lengths; it may also be used for sharpening large stakes, and for many other purposes. It is also advisable to have, in addition, one of a larger size, if such work as tree-felling has ever to be executed.

Bill-hooks. One or more of these are in frequent requisition for sharpening stakes, chopping firewood, cutting down high hedges, large common shrubs, &c. Bill-hooks are made with or without a chopper at the back. They are familiar to everyone, and are in constant use.

Brooms. For outdoor work, sweeping lawns, walks, &c., birch Brooms are most generally used, and are best adapted. In some gardens, these are made in wet weather by the workmen, but Brooms ready for use may be procured in any quantity when this is inconvenient or impracticable. In either case, the wood or a stock of Brooms should be procured in winter before the sap rises; when deferred until this takes place, the twigs are much less tough, and do not last. Brooms, or reserve wood for making them, may best be kept in an open or airy shed, preferably on the cross-beams, where it is dry. For cleaning the floors of glass structures, the ordinary long-handled Brooms generally used in houses are best.

Chisels. In pruning operations, when the pieces to be detached are inconveniently situated for cutting, either with a knife or pruning-saw, Chisels are sometimes used. For this purpose, those employed in gardens are somewhat similar in shape to those used by carpenters. Chisels are occasionally employed for pruning at considerable elevations; they are attached to handles of various lengths. When grafting large tree stocks, by the cleft method, a chisel shaped somewhat like a sharp wedge is employed; this is called a Grafting Chisel. Besides these, a strong, wrenching Chisel is always valuable in a garden, for opening cases, &c., which usually arrive, more or less frequently, by rail.

Crowbars. One of these, at least, is recommended to be kept for making holes wherein to insert strong stakes, or any which cannot conveniently be driven into the solid ground. A round bar of iron, with one end tapered to a point, and the other made wedge-shaped, is most generally employed: the wedge end is sometimes valuable for levering or lifting plants in large tubs and other things which are unusually heavy.

FIG. 47. DAISY GRUBBER.

Daisy Grubbers and Daisy Rakes. For removing Daisies from lawns these tools are employed. The Grubber is an implement about 18in. long, with a handle at one end and a claw at the other (see Fig. 47), for digging up Daisies by the roots. Daisy Rakes have broad teeth with sharp edges (see Fig. 48) that cut off Daisy flowers from lawns, but of course do not destroy the roots. The latter may be used for raking short lawn grass instead of sweeping it with a broom.

FIG. 48. DAISY RAKE.

Dibbers. These may be made from pieces of ordinary wood, shaped like a right angle, or somewhat like an obtuse angle, and pointed, or from old spade handles; the latter are generally favoured (see Fig. 49). To make them last a long time, the points are sometimes cased with steel, but there is no real necessity for this. Dibbers are of most use where the soil is rather light; in heavy lands, the holes made by them are often smooth inside, and the roots of plants do not so readily penetrate. The uses to which Dibbers are put, for inserting plants, &c., are generally well known. The Potato Dibber has a handle long enough for a workman to use standing upright, and is provided with a piece of wood or iron, which is used as a treadle. This, being fixed at the required distance from the end, insures all the Potato sets being put in at a uniform depth below the surface of the soil.

FIG 49. DIBBER.

Edging-iron, or Verge-cutter. A tool used for cutting out beds in turf and for trimming the edges of walks in flower-gardens, pleasure-grounds, &c., when these are composed of turf. It consists of a sharp-cutting steel blade formed in the shape of a crescent (see Fig. 50), with a socket attached, into which a round handle is fixed, with a cap on the top like that of a spade. There are other kinds of Verge-cutters, but this is the one generally used, and it answers most effectually. It may be guided to cut edges, outlines of beds, &c., in turf, of almost any desired shape.

Forks. Forks of one or more kinds are amongst the most useful implements in gardens: for many purposes,

Tools, Implements, &c.—*continued.*

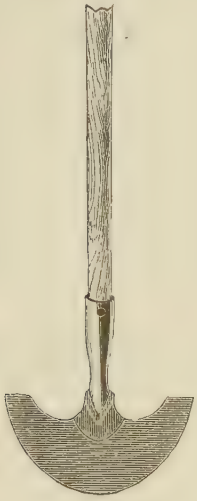

FIG. 50. EDGING-IRON.

there is nothing which could form an efficient substitute. Forks should always be light: they cannot be readily handled and used when constructed so as to appear heavy when lifted. For digging, either a four or five-tined Fork is best: the latter is generally preferable of the two, as the tines or prongs are close together. Most Digging-forks are made with narrow, steel tines, but a useful kind for such work as Potato-digging has broad

FIG. 51. FLAT-TINED DIGGING-FORK.

ones, as represented in Fig. 51. For digging hard ground, a Fork is not a good substitute for the spade, but when the soil is light and also loose at the bottom it may sometimes be substituted with advantage. In transplanting trees of any description, a Digging-fork with narrow tines should always be used for separating soil which surrounds the roots. Dung-forks are invaluable for turning and mixing litter and leaves, or any light manure. The best are those with either three or four small, steel tines, which pass readily through the manure, and seldom clog when in use. Other kinds of Forks are made for special purposes—as, for instance, very large ones, with four or five long prongs, for loading leaves; and others, with long handles and only two prongs (like those used for haymaking, but stronger), for lifting bundles of straw, wood, &c. There are also small Hand Forks, with three flat prongs, which are useful for plunging plants amongst tan or cocoa-nut fibre.

Grubbing-axe, Pick, and Pickaxe. Whenever there are trees of more than ordinary size to be rooted out by garden workmen, one or more Grubbing-axes should be included in the list of tools. Common Picks are requisite for breaking up the surface of walks, &c., and one end of the pickaxe may also be used for similar purposes. The difference between these had better be explained: the ordinary or common Pick has both of the ends pointed, and cannot, therefore, be used for cutting roots; a Pickaxe has one end pointed, and the other made like a chopper, its edge being in line with the handle; the Grubbing-axe has both ends wedge-shaped for cutting—one being in line, and the other turned cross-

Tools, Implements, &c.—*continued.*

ways, with the handle (see Fig. 52). The ends of all these require, when in constant use, rather frequent attention by a blacksmith; otherwise, they soon get blunt.

FIG. 52. GRUBBING-AXE.

They should be well steeled and tempered, to make them last as long as possible without being repaired, and to keep the point or edge sharp and in good order.

Hammer. The best form of Hammer for gardening purposes is that with rather a short head, having a claw

FIG. 53. GARDEN HAMMER.

at the back (see Fig. 53), for drawing out old nails when training wall trees. This is the principal use for which Hammers are required.

Hoes. These are requisite in all gardens for many purposes, the forms most employed being the Swan-necked

FIG. 54. SWAN-NECKED DRAW-HOE.

Draw-hoe (see Fig. 54), and the Dutch or Thrust-hoe (see Fig. 55). The first-named is better than the old form

FIG. 55. DUTCH OR THRUST-HOE.

of Draw-hoe, which soon gets clogged with soil round the eye, particularly if it is the least sticky or wet. Besides hoeing to destroy weeds, this kind of Hoe, which is made in various sizes, is the best for drawing drills for seeds, earthing-up crops, &c. Dutch Hoes, also made in various widths, are sometimes preferred for breaking up the surface of the ground, hoeing flower-beds, and cutting up small weeds in summer. There are two or three other kinds of Hoes which are not altogether requisite: a reference to these may be found under **Hoes and Hoeing.**

Mallet. A Mallet is useful for driving stakes into the ground, as, for example, those used for Raspberries and young fruit-trees. It is also required when a chisel is used for cutting off branches, &c., and for various other purposes. A moderately heavy one is best adapted, and it should be made from wood that will not readily split.

Rakes. Both iron and wooden Rakes are necessary in gardens, for levelling ground, and for cleaning up refuse of every description. Ordinary wooden ones, such as are

Tools, Implements, &c.—*continued.*

used for haymaking, are best adapted for raking and cleaning large breadths of garden grounds or lawns, and also for levelling gravel. If they are too heavy, the heads may easily be reduced in width and, consequently,

FIG. 56. IRON RAKE.

in weight. Iron Rakes (see Fig. 56) are best for cleaning flower-beds, &c.; it is always advisable to have what is called a set—that is, four or six different ones, varying in width. They should be made light, and not clumsy to handle.

Rammers. These are necessary when new walks are being made, or turf relaid; they are also required occasionally for ramming the soil round posts, &c. The handiest form is that with a circular, iron head, with socket attached into which a handle is fixed. Iron Rammers are made in various sizes: those weighing from 7lb. up to 10lb. are handy, and not too heavy to work.

Reel and Line. For all garden Lines of considerable length, iron Reels should be provided: the Lines are more readily wound up, and they are always subjected to a circulation of air, which dries and preserves them better

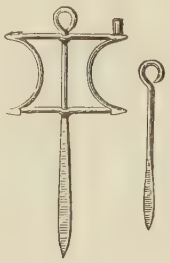

FIG. 57. LINE REEL AND PIN.

than when rolled upon straight, wooden stakes. All Reels should be provided with a small handle projecting above the upper crossbar for turning it to wind up the Line. A strong iron pin accompanies the Reel, for tying the line to at one of the extreme ends, the other end being fastened to the reel before winding (see Fig. 57).

Rollers. Where there are walks and lawns, one or more Rollers are needed to keep the surfaces even and firm. They are made in various sizes, and, consequently, of different weights, usually of cast, but sometimes of wrought, iron. Some have the cylinder in two halves, which revolve separately, and allow of turning more readily at the end of a walk, or in another direction to that which has previously been traversed, than if there was only one. When rolling newly-gravelled walks, it is best to have two Rollers—one, a light one, for drawing first, and another, heavy, for rendering the walk firm. All Rollers should be provided with a balance for the handle; otherwise, the weight of this comes on the workman, who should only have to pull. The balance, besides effecting the purpose for which it is intended, also adds to the weight of the Roller.

Scythes. For mowing under trees, round shrubs, and on sloping banks and in places where the mowing machine cannot be used, Scythes are requisite; they may also, of course, be used for lawns, but are far inferior to a machine. The ordinary form of Scythe and handle answers very well, although workmen who have been accustomed to cut long grass cannot at first succeed in properly cutting lawns. The two projecting handles should be regulated for, or by, each person who intends

Tools, Implements, &c.—*continued.*

using the Scythe, as it is generally necessary to vary their positions to suit individuals.

Shears. Of these there are several kinds, the most necessary being those used for grass-edging, hedge-trimming, and pruning. Grass-edging Shears of the ordinary make, with handles about 3ft. long, are best adapted for general use; the handles should be set on a wider angle than a right angle, taking the cutting blades for the base line. This places the workman, when using the shears, a little behind the blades, and thus enables him to perform his work more effectually. Hedge-trimming Shears have blades nearly equal in length to the handles, 10in. to 12in., and are about 2in. in width; they are used with both

FIG. 58. SMALL HAND SHEARS.

hands. Small Shears (see Fig. 58), for using with one hand, are invaluable for trimming any kind of edgings on a small scale, and for clipping plants which sometimes need it in carpet bedding and other designs. Pruning Shears vary in size according to the dimensions of branches they are intended to cut, from those used easily with one hand, to others, some 3ft. in length (generally called Parrot-bill Shears), that are adapted for severing branches of nearly 2in. in diameter when the wood is not hard.

Shovels. These are preferable to spades for shifting or loading loose soil, sand, gravel, &c. The handiest Shovels for gardens are those of medium size, with a square point, and the side edges slightly turned up. The handle should have more bend in it than that of a spade, as this renders shovelling easier. Shield-shaped Shovels are best for shifting stones, and those made entirely of iron are most serviceable for stoking.

Spade. The Spade and its value as a garden tool are matters familiar to everyone; it would be impracticable to prepare ground for successional crops without it, as there is nothing which could form an efficient substitute. The two points in a Spade that it is most important should be strong are the back of the part which lifts the soil and the handle just where the first rivet passes through from the capped end. At one of these places Spades will sometimes either bend or break, if they are of inferior make, before they have been used many days. These points should, therefore, be examined by purchasers: it causes great hindrance and loss to have new handles put in—work which is rarely very well done a second time over; and if the back breaks, there is no chance of remedying it. Spades are sometimes broken by improper usage, such as wrenching anything too heavy: this is, of course, a fault on the part of the workmen using them.

Syringes. A Syringe is especially required in glass structures for dewing or washing fruit-trees and plants in general at some part of their season of growth. It requires careful handling, and the barrel should not be knocked against any hard surface, which would cause indentations, and prevent the piston from working properly inside. The best Syringes are usually provided with two, or even three, movable roses of different kinds, any one of which may be used according to the force of water required. The kind most generally useful is that with a nozzle in which a ball is placed. When the piston-rod is drawn, the ball allows water to pass in, but it must be expelled through a small tube placed alongside, as the ball fits and closes the nozzle when pressed from behind with water and the piston. By practice, a workman

Tools, Implements, &c.—*continued.*

may spread the water with his finger, and direct its course at will to any position or part of the house. If this cannot be done readily, another perforated rose may be screwed on instead, which will separate the particles of water as they pass through it.

Trowel. Garden Trowels are indispensable for lifting and replanting such things as carry a ball of earth with their roots. For bedding-out in May and June, Trowels are in constant demand, and at all seasons use is generally found for them.

Turfing-iron and Turf-beetle. The first-named is an implement with a somewhat heart-shaped blade, and a bent

FIG. 59. TURFING-IRON.

handle (see Fig. 59). It is used for lifting turf that has previously been marked out and cut through with an edging-iron. The Turf-beetle consists of a flat piece of wood, about 3in. thick, with a handle attached at an acute

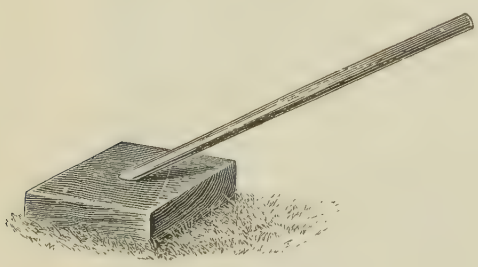

FIG. 60. TURF-BEETLE.

angle (see Fig. 60), to allow of the implement falling flat when lifted and brought down on to the turf. It is used principally for levelling newly-laid turf.

TOOL-SHED. A Tool-shed should be found in every garden. It should be provided with pegs, made of either wood or iron, and fixed near the ceiling, for hanging up Dutch hoes, rakes, scythes, and any other tools with long handles. Other pegs may be situated lower down for forks, shovels, spades, &c. A cupboard or chest should contain all small tools and implements, such as hammers, shears, trowels, &c. Every workman should help to keep the Tool-shed tidy, and the tools in good order, by cleaning everything he uses when any work is finished during the daytime, and returning it to its proper place, and also doing the same every evening when the hour for suspending work arrives.

TOONA. Included under *Cedrela.*

TOOTHACHE-TREE. *See* **Zanthoxylum americanum.**

TOOTHBRUSH-TREE. A common name for **Salvadora persica** (which *see*).

TOOTHED. Having any kind of small divisions.

TOOTHLETED. Furnished with little teeth.

TOOTHWORT. *See* **Dentaria** and **Plumbago scandens.**

TOPIARY WORK. Although the absurd fashion of cutting and torturing trees into all sorts of fantastic shapes has, happily, almost passed away, yet, as the art of the Topiarist was for a considerable period regarded as the perfection of gardening, some mention of it is desirable here. When the fashion first became popular in Britain, it is probably impossible to ascertain; but it reached its highest point in the sixteenth century, and held its ground until driven out of the field, in the last century, by the natural or picturesque style. From an archæological point of view, it is not to be regretted that examples of Topiary Work on a large scale still exist in several British gardens. Fig. 61 (for which we are indebted to Messrs. Veitch and Sons) represents a view at Elvaston Castle, near Derby. "A large portion of this consists of ornamental hedges of the common Yew, either dividing parts of the grounds from each other, or inclosing spaces devoted to special subjects; and of single specimens, both of the common Yew and its golden variety, cut into conical pyramids of uniform size and height; and of such as these there are upwards of one thousand. There are comparatively few representations of birds and animals; the bolder work represents the walls and bastions of a Norman castle, archways, alcoves, arbours, &c. The great extent of the Topiary Work at Elvaston is calculated to excite surprise rather than admiration; at the same time, its extreme formality is greatly relieved by the noble Conifers of the Fir and Pine tribe which have been planted beside and around it with no sparing hand, and by the beautiful view of the river Derwent, in its winding course through the grounds" (Veitch, "Manual of the Coniferæ").

Levens Hall, in Westmoreland, is a still more famous Topiarian garden than Elvaston. For an account of this, and an illustration, see vol. xxvi. of the "Archæological Journal." Two illustrations of some of the most remarkable groups in this same garden appeared in the "Gardeners' Chronicle" for 1874, vol. ii., p. 264. Here may be seen figures of the British Lion; of Queen Elizabeth and her ladies; of the Judge's Wig, a number of Yews planted in a half-circle, so as to form an arbour, by bringing the branches over the top in a hood or wig-like fashion; and many others. The astonishing tenacity of life possessed by the Yew is thoroughly proved by the fact that, as the figures (at Levens) above mentioned were first formed early in the eighteenth century, the bulk of the young growths must have been cut off for upwards of one hundred and eighty years, in order to keep the requisite size and form of the objects represented.

Topiary Work—*continued.*

The vast amount of not unskilled labour requisite to maintain in order any elaborate Topiarian designs will, no doubt—apart from any question of taste—prevent a recurrence of such practices to any appreciable extent. Evergreens were almost exclusively used, and of these, the Box, Yew, and Holly were those which lent themselves most readily to the Topiarist's skill. For columns

Topiary Work—*continued.*

and other more or less simple figures, the ordinary principle which now rules the clipping of a Yew hedge was sufficient. The branches were checked where too strong, and allowed to develop when not so vigorous, until the requisite size and shape were obtained, after which repeated clippings were necessary, beginning as soon as the young growths appeared in spring. For

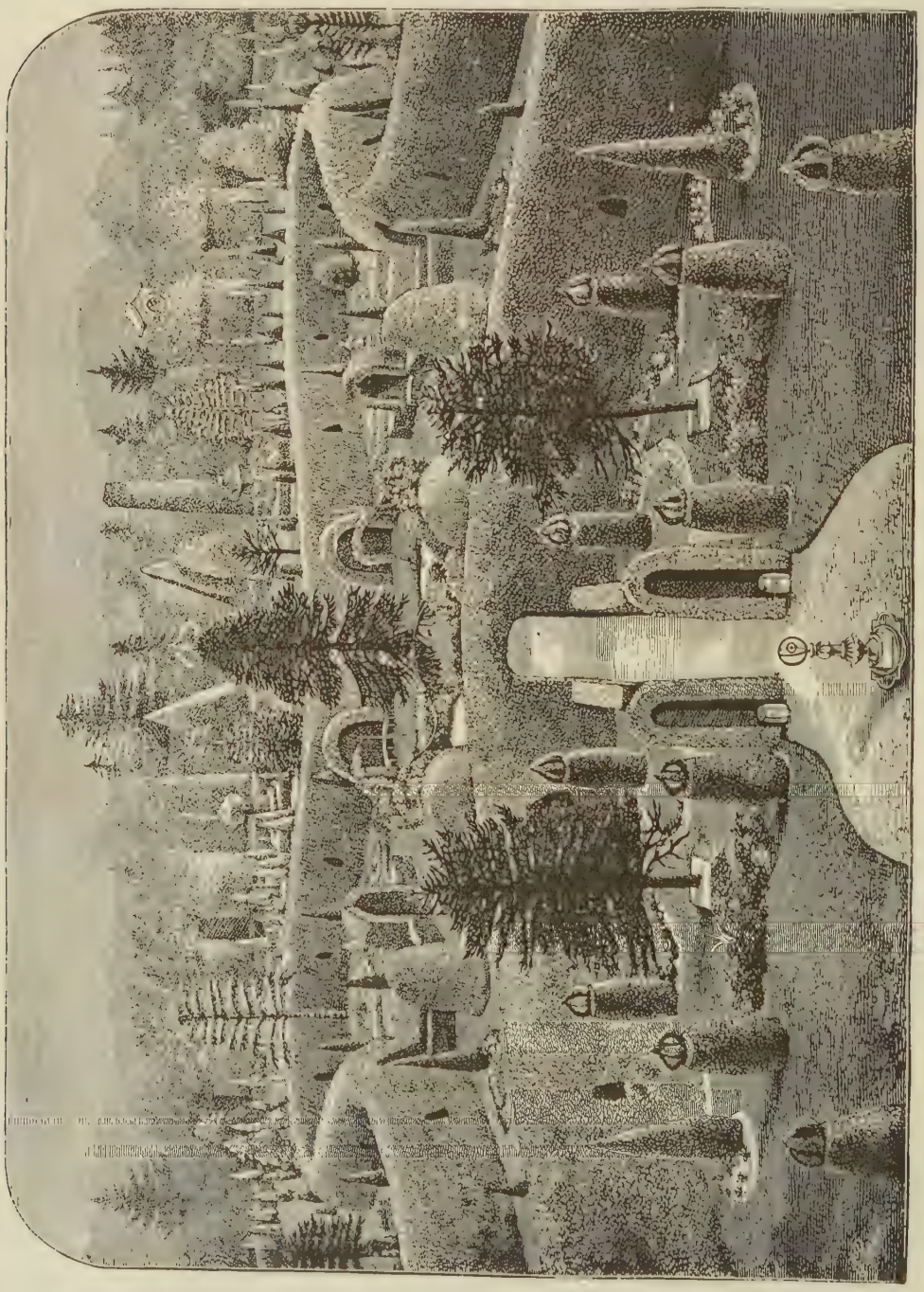

FIG. 61. TOPIARY WORK—THE YEW GARDEN AT ELVASTON CASTLE.
(From Veitch's "Manual of the Coniferæ.")

Topiary Work—*continued.*

elaborate figures, a number of plants might be used, and the leading branches of these might be united by "approach-grafting," until a regularly compact network of interlacing branches were securely growing together. By this means, less damage would be likely to occur through heavy falls of snow, or from violent gales. In one of the continental gardens, a few years ago, there were several young plants of the common Ash, grown so as to form, amongst other things, a more or less perfect crown, simply, as the label stated, to show what the skill of the grafter could accomplish. Some half-dozen tall young plants were placed in a circle: one of these was grafted, at some 6ft. from the ground, by approach to the other five, so as to present the appearance of a ring horizontally supported by half-a-dozen stems; from this ring were allowed to develop a series of branches, which were curved over and united into one stem by grafting. After this the branches again divided, and were made to assume other unnatural forms.

Constant attention is required in pruning and disbudding all such strong-growing plants as the Ash, and distorted and unsightly branches and stems are sure to be the result in a comparatively short time.

TOP-SHAPED. Inversely conical, with a contraction towards the point.

TORCHES. *See* **Verbascum Thapsus.**

TORCH LILY. A common name for **Kniphofia** (which *see*).

TORCH THISTLE. An early name given to various species of **Cereus** (which *see*).

TORDYLIUM (the old Greek name used by Dioscorides). Hartwort. ORD. *Umbelliferæ.* A genus comprising about a dozen species of hardy, annual herbs, natives of Europe, North Africa, and temperate and Central Asia. Flowers white or purplish, in compound, many-rayed umbels. Leaves undivided or pinnate. The species possess no beauty.

TORENIA (name commemorative of Olef Toren, a Swedish clergyman, who discovered *T. asiatica* and other plants in China; he died in 1753). SYNS. *Nortenia, Pentsteria.* ORD. *Scrophularineæ.* A genus embracing about sixteen species of stove, glabrous, pubescent, or hairy herbs, natives of tropical and Eastern extra-tropical Asia and tropical Africa; one is also found in South America, where it was probably introduced. Calyx tubular, plicate or three to five-winged, obliquely three to five-toothed or bilabiate at apex; corolla tube cylindrical or enlarged above, the upper lip broad, emarginate or bifid, the lower one spreading, of three broad, subequal lobes; stamens four, perfect; pedicels ebracteolate; racemes short, few-flowered, fascicle-like, or rarely elongated. Leaves opposite, entire, crenated or serrated. The species known to cultivation are described below. They are of easy culture, and are admirably adapted for hanging baskets as well as for pot culture. The annuals may be raised from seed, sown in March or April, and placed in a warm temperature. When large enough to handle, the seedlings should be pricked off into the pots or baskets in which they are intended to flower. Torenias may also be readily propagated by cuttings: any young shoots will root in a close frame, or under a hand glass in a warm house. A compost of loam and leaf mould, with a little sand or charcoal intermixed, is most suitable. *T. Fournieri*, which grows erect, is best adapted for pot culture: its branches, which do not trail, need the support of a few small stakes. Green Fly are often troublesome to these plants when young. As a preventive, fumigate occasionally.

T. asiatica (Asiatic).* *fl.* on axillary and sub-umbellate pedicels; calyx 1in. long, scarcely winged; corolla blue, 1¼in. to 1½in. long, with very dark violet lateral lobes. June. *l.* shortly petiolate, ovate-cordate or ovate-lanceolate, serrated, 1½in. to 2in. long. Branches 6in. to 10in. long, slender, diffuse. India, &c., 1845. (B. M. 4249; F. d. S. x. 5, xiii. 1342; I. H. 199.) Annual.

T. a. hirsuta (hairy). *fl.*, lower filaments having a very small tooth. Plant more pubescent than the type. (B. M. 5167, under name of *T. hirsuta.*)

T. auriculæfolia (Auricula-leaved). *fl.* numerous, growing separately on slender scapes; corolla lobes pale lilac, blotched with purple and veined with white on the disk. Summer. *l.* radical, sessile, ovate. India, 1871. This plant has much the habit of a *Pinguicula.* (F. M. 534.) Its proper name is *Craterostigma pumilum.*

T. Bailloni (Baillon's). A synonym of *T. flava.*

T. concolor (one-coloured). *fl.* large, on axillary peduncles longer than the leaves; corolla concolorous, violet-blue. Summer. *l.* stalked, ovate-cordate, acute, serrate. *h.* 6in. to 12in. China, 1844. A glabrous or sparingly-pubescent herb, with diffuse, elongated branches. (B. M. 6797; B. R. 62.)

T. cordifolia (cordate-leaved). *fl.* axillary and sub-umbellate; corolla pale blue, ⅜in. long; pedicels often longer than the leaves. July. *l.* petiolate, ovate, serrated, 1in. to 1½in. long, cuneate or very rarely cordate at base; petioles rarely as long as the blade. *h.* 4in. to 8in. India, &c., 1811. A sub-erect, sparsely hairy annual. (B. M. 3715.)

T. edentula (toothless). A synonym of *T. peduncularis.*

T. flava (yellow).* *fl.* axillary and in distant pairs; corolla yellow, ½in. to ¾in. long, with a purple eye; pedicels usually shorter than the calyx. Summer. *l.* sessile or petiolate, ovate or oblong-ovate, obtuse, entire or crenated. *h.* 6in. to 10in. India, &c., 1878. Erect or decumbent, sparsely hairy or glabrous. (B. M. 6700.) SYN. *T. Bailloni* (B. H. xxix. i., fig. 2; I. H. xxv. 324; R. H. 1879, 15). Annual.

T. Fordii (Ford's). *fl.* on short, sub-terminal, axillary peduncles; calyx with almost triangular teeth; corolla small, with an exserted tube, the limb straw-coloured with the lateral lobes blotched with violet. Summer. *l.* shortly-stalked, broadly ovate-rotundate or cordate. *h.* 6in. to 12in. An erect, pubescent herb. China. (B. M. 1797.)

T. Fournieri (Fournier's).* *fl.*, calyx ¾in. long, broadly five-winged; corolla tube pale violet, yellow at back, 1in. long; limb 1½in. in diameter, the upper lip pale lilac, obscurely two-lobed, the lower one of three much smaller, bright violet, rounded lobes, the central one with a golden blotch at base; racemes terminal, erect. Summer. *l.* 1½in. to 2in. long, ovate or ovate-cordate, acute, serrated, bright green. Branches crowded, erect from the root, 4in. to 8in. high, much-branched. Cochin China, 1876. Highly glabrous. Annual. (B. H. 1879, 1; B. M. 6747; Gn., Dec. 1877; I. H. n. s. 249; R. G. 927; R. H. 1876, 465.)

T. hirsuta (hairy). A variety of *T. asiatica.*

T. peduncularis (pedunculate-flowered). *fl.* usually pale blue, with yellow spots, midway between those of *T. asiatica* and *T. cordifolia*, but the filaments are not toothed, as in those species. June. *l.* petiolate, ovate, crenate-serrated. *h.* 6in. India, Philippines, &c., 1845. Decumbent or sub-erect, glabrous or softly hairy. SYN. *T. edentula* (B. M. 4229).

TORFACEOUS. Growing in bogs or mosses.

TORINGO CRAB. *See* **Pyrus Toringo.**

TORMENTILLA. Included under **Potentilla** (which *see*).

TORMENTIL-ROOT. A common name for **Potentilla Tormentilla** (which *see*).

TORNELIA. A synonym of **Monstera** (which *see*).

TOROSE. A cylindrical body, irregularly swollen.

TORRESIA. A synonym of **Hierochloë** (which *see*).

TORREYA (named in compliment to Dr. John Torrey, 1796-1873, an American botanist, and one of the authors of the "Flora of North America"). Stinking Yew. SYNS. *Caryotaxus, Fœtataxus.* ORD. *Coniferæ.* A genus embracing only four species of hardy, evergreen trees, emitting a strong, disagreeable odour from all parts when bruised, natives of North America, North China, and Japan. Flowers dicœcious, the males solitary and sub-sessile in the axils, the female catkins axillary, sessile, one-flowered. Fruit ovoid, drupe-like, ¾in. to 1½in. long. Leaves sub-spirally affixed, distichously spreading, very shortly petiolate, linear, flat, similar to those of *Taxus*, but longer. The species do not attain in Great Britain anything near the beautiful aspect they assume in their

Torreya—*continued.*

native countries. Torreyas thrive in almost any soil They are readily propagated from seeds, which should be sown in spring; the ripe fruits, after being gathered, should be mixed with sand, and treated similarly to those of the Hawthorn, until sowing time. Cuttings also afford a ready means of increasing the stock of any species; these should be inserted in sandy soil, in August, and kept shaded under handlights, or in cold frames, during bright sun, until rooted. Layering may also be advantageously resorted to.

T. californica (Californian). Californian Nutmeg. *fr.* with a leathery-green covering. *l.* long, narrow, and opposite on the branchlets, but somewhat alternate and scattered round the principal shoots, linear-lanceolate, spiny-pointed, shortly petiolate, decurrent at base, 2in. to 2½in. long, pale yellowish-green. *h.* 20ft. to 40ft. California, 1851. See Fig. 62. (B. M. 4780; F. d. S. 925; G. C. n. s., xxii., p. 631, under name of *T. myristica.*)

Torreya—*continued.*

T. grandis (great).* *fr.* green, the size of a small walnut. *l.* very rigid, linear-lanceolate, rather short, somewhat falcate, ¾in. to 1in. long, light glossy-green above, much paler, with two narrow, greyish lines beneath, on very short, spirally-twisted footstalks, more or less opposite, spiny-pointed. Branches whorled, horizontally spreading; branchlets laterally distichous. *h.* 60ft. to 80ft. China. See Fig. 63. (G. C. n. s., xxii., p. 681; R. H. 1879, 173.) SYN. *Cephalotaxus umbraculifera.*

FIG. 62. BRANCH, WITH ONE MATURE AND TWO YOUNG FRUITS, OF TORREYA CALIFORNICA.

T. myristica (nutmeg-shape-fruited). A synonym of *T. californica.*

T. nucifera (nut-bearing). *fr.* ¾in. long, ½in. broad, oval or ovate-oblong, glossy. *l.* linear, rounded at base, quite straight, flat, leathery, spiny-pointed, mostly curved downwards, 1in. to 1¾in. long, on very short footstalks, deep glossy-green, glaucous-white beneath. Branches numerous whorled, alternate, or scattered along the stem, horizontally spreading. *h.* 20ft. to 30ft. Japan. See Fig. 64. (R. H. 1873, 315; S. Z. F. J. 129.)

T. taxifolia (Yew-leaved).* Stinking Cedar. *fr.* oval, a little pointed, nearly as large as a walnut. *l.* rounded at base, and somewhat recurved at the extremity, linear, frequently falcate,

FIG. 63. BRANCH, WITH IMMATURE ABNORMAL FRUITS, OF TORREYA GRANDIS.

Torreya—*continued.*

FIG. 64. BRANCH, WITH MALE FLOWERS, AND DETACHED CLUSTER OF MALE FLOWERS, OF TORREYA NUCIFERA.

stiff, leathery, on very short footstalks, twisted and decurrent at base, spiny-pointed at apex, 1in. to 1¾in. long, glossy and convex above, beneath pale glaucous-grey, and marked on each side the

FIG. 65. BRANCHLET AND FRUIT OF TORREYA TAXIFOLIA.

midrib with two narrow, reddish, sunken bands. Branches mostly whorled, spreading; branchlets horizontal. *h.* 40ft. to 50ft. Florida, 1840. See Fig. 65. (G. C. n. s., iv. 291.)

TORRUBIA (named by Leveille, in honour of a Spanish writer on "Vegetable Wasps," as wasps attacked by the plants of this genus [see below] were formerly called). A genus of Fungi, of which by far the larger number are parasitic in insects, spiders, and their allies; while a small number live on other Fungi. *Torrubia* is the name by which the genus is generally known; but it must give place to the name *Cordyceps*, previously conferred by the eminent Swedish mycologist, Elias Fries.

The genus belongs to the group of compound **Pyrenomycetes** (which *see*); but is peculiar in the substances on which the various species live, and also in the erect, clubbed, fleshy mass of mycelium (called a *stroma*), the appearance of which is shown in Fig. 66. On, or embedded in, it are the flask-shaped perithecia, inclosing the asci. In each of the latter are eight thread-like spores, which usually soon break into joints. These joints are capable of giving origin to the cycle again, if they fall on a suitable stratum, *e.g.*, the body of an insect. But they produce not the Pyrenomycetous fungus, but a smaller vertical stroma, branched or simple, composed of a bundle of mycelium threads, which bear numerous round or elliptical, pale, minute conidia, or spores. This stage of these Fungi was formerly regarded as belonging

Torrubia—*continued.*

to a distinct group (*Hyphomycetes*), without asci, and the various forms were grouped together under a new generic name—*Isaria*. This genus resembles *Cordyceps* in having an erect, club-shaped stroma; but, instead of inclosing perithecia with asci, the filaments of the mycelium end in free tips, each of which bears small, oval or globular, pale conidia, capable of reproducing either *Isaria* or *Cordyceps*. For convenience, the genus *Isaria* is still kept up, as the perfect or mature forms of a large number of the Fungi placed in it have not yet been recognised, and to attempt to dispense with the group would, at present, only cause confusion and

FIG. 66. CORDYCEPS SINENSIS, GROWING ON THE LARVA OF A MOTH—*a*, Stroma of the Fungus, divided at the tip into three branches; *b*, the Larva, from which the Fungus has grown out.

uncertainty. Moreover, there is reason to believe that several of the forms referred to *Isaria* do not belong to *Cordyceps*, but should be referred to other genera; inasmuch as they live on a wider range of materials, and some injure *living* plants also (*e.g.*, *Isaria fuciformis* destroys grasses in Australia and in the South of England), while *Cordyceps* is not known as a parasite on living plants. Most of the species in the latter genus abound in tropical countries; but several have been found in Britain, in all their stages of development, on dead insects. Among the best-known of these are *C. entomorrhiza* and *C. militaris:* these form slender stalks 1in. to 2in. in height, the clubbed heads on which are ovoid or globose. On tracing the stalks downwards, they are found to rise from the bodies of larvæ or pupæ, buried in the soil or among dead leaves. These Fungi may be regarded as beneficial to gardeners, inasmuch as they destroy insects, many of which feed on garden produce. They are not often met with, however, and can

Torrubia—*continued.*

scarcely be regarded as of much importance from this point of view. On the other hand, no species of *Cordyceps* is known to be injurious in gardens. Probably, the species most widely known, by its popular name at least, is the so-called "Vegetable Caterpillar," often sent from New Zealand. This reaches a height of from 6in. to 8in., the club being from 3in. to 4in. long, and $\frac{1}{8}$in. thick. It grows out of the body of some large larva (usually that of an insect allied to the Otter Moth or Ghost Swift), and is often erroneously supposed by the finders to be a caterpillar in course of development into a Fungus. This Fungus is *C. Hugelii*, Corda; though more generally referred to in English works by the name *C. Robertsii*, given to it, by the Rev. M. J. Berkeley, at a later date than Corda's. Mr. Berkeley has described a still larger species from Australia, under the name *Sphæria Taylori*.

TORRUBIA (of Vellozo). A synonym of **Pisonia** (which *see*).

TORTOISE-PLANT. *See* **Testudinaria elephantipes.**

TORTRICINA (from *torqueo*, to twist). A group of Moths, popularly known as Leaf-rollers, because of the habit exhibited by the larvæ of many species of rolling up the leaves of their food-plants into tubes, in which they shelter themselves from birds and other foes. Inside the tubes the larvæ live and feed in safety; but when the food-plant is shaken, each larva drops from its tube, and hangs suspended by a silken thread. When the danger is past, the larva climbs up the thread, and regains the shelter of the tube. Many larvæ become pupæ in the tubes. Some species live in roots or twigs (*see* **Retinia**), or in unripe fruits (*see* **Apple or Codlin Grub**). The *Tortricina* are all of small size, scarcely any of the moths reaching 1in. in spread of wings. The body is slender, but the wings are comparatively broad, and when at rest they slope like the roof of a house above the body. In many, the costa, or front margin, of the wings is peculiarly curved; so that the insect at rest is not unlike a bell in outline when seen from above. The front wings are, in most of the species, rather uniformly coloured; usually being some shade of brown, with darker markings, or bands and spots. Some show metallic spots; and others have the wings variegated with black and white, while others have them some uniform shade of green. The palpi, or feelers attached to the mouth-pieces, are short and inconspicuous. The larvæ have never less than sixteen prolegs, or sucking feet, on the hinder rings of the body.

A good many species of this group are injurious to cultivated plants, often by eating the leaves; *e.g.*, *Tortrix viridana* sometimes strips Oak-trees bare. Roses are also much damaged by several species that live in the rolled leaflets, or inside the leaf-buds and flower-buds. Most fruit-trees are more or less liable to similar injuries; and the *Coniferæ* often have the twigs pierced up the centre by the larvæ. Herbaceous plants, though occasionally attacked, are far less often seriously damaged than woody plants or shrubs.

Remedies. These vary according to the nature of the injury done. Larvæ in tubes are best got rid of by beating the branches well over sheets, or over vessels tarred inside to prevent the escape of the larvæ. The insects shaken off should be destroyed. Such as live in twigs are more difficult to dislodge; but sickly twigs should be cut off and burned. Fruits tenanted by larvæ usually fall prematurely, and such windfalls should, without delay, be collected from the ground, and destroyed, or given to pigs, as the larvæ very soon bore out of the fruits, and pass into the soil, there to remain all winter as pupæ. Further information is given under **Moths, Oak** (INSECT PESTS), and **Tortrix.**

TORTRIX (from *torqueo*, to twist; in allusion to the leaves of plants being twisted or rolled by the larvæ, to form tubes in which they live). The leading genus of the group of small Moths known as the *Tortricina*. The genera in this group are distinguished from one another by very slight characters, so that it is difficult for any one but a specialist to be sure of the genera and species. *Tortrix* is closely related to several other genera, and its extent is somewhat uncertain; some specialists forming several genera from an assemblage of species that others consider ought to be retained in one genus. In the genus, even when most restricted, there are several species hurtful to garden produce and to cultivated trees. Of these the most destructive is *T. viridana*. This insect has the fore wings pale green, with their front margin sulphur-yellow; they extend from $\frac{2}{3}$in. to 1in. in span. The larvæ live in tubes formed by rolling up leaves of almost all kinds of trees, and of some shrubs; but they are peculiarly destructive to Oaks, which they occasionally strip absolutely bare. *T. icterana* has pale-ochreous wings, and is about the same size as *T. viridana*. Its larvæ feed mostly in rolled leaves of herbs, and may be looked on as almost harmless, as they usually feed on weeds. *T. heparana* and *T. ribeana* are both brown, with darker markings. The larvæ of both feed on the leaves of various trees, and are at times hurtful to fruit-trees. *T.* (*Œnectra*) *Pilleriana*, though very rare in Britain, is, in some seasons, very destructive to Vines in France, and elsewhere on the Continent, stripping off the leaves. The larvæ have been observed passing the winter sheltered under loose bark, emerging in spring to feed on the buds and young leaves. The fore wings of this Moth have a spread of only about $\frac{2}{3}$in.; they are pale ochreous, with a brown patch near the base, and a brown cross-bar in the middle. The other British species of the genus are not sufficiently hurtful to call for special mention.

Remedies. These are given under **Tortricina.**

TORTULA (of Roxburgh). A synonym of **Priva** (which *see*).

TORTUOUS. Having an irregular, bending, and turning direction.

TORULOSE. Slightly torose.

TORUS. The same as **Thalamus** (which *see*).

TOTARA PINE. *See* **Podocarpus Totara.**

TOUCH-ME-NOT. *See* **Impatiens noli-me-tangere.**

TOURNEFORTIA (named in memory of Joseph Pitton de Tournefort, 1656-1708, the distinguished author of an arrangement of plants under the title of "Institutiones Rei Herbariæ"). Including *Messerschmidia*. ORD. *Boragineæ*. A large genus (nearly 100 species) of stove, greenhouse, or hardy trees or shrubs, sometimes sarmentose or twining, very rarely sub-shrubs, broadly dispersed over the warmer regions of the globe. Flowers rather small, cymose; calyx five-parted; corolla with a cylindrical tube and five imbricated or induplicate lobes; stamens five, affixed to the tube, included. Leaves alternate, entire. The species have little or no horticultural merit. Only two call for mention here: both thrive in any fairly good soil. Propagation may be effected by cuttings, inserted in sand, under a glass, with heat in the case of *T. heliotropioides*, which is the prettiest plant of the genus.

T. fruticosa (shrubby). *fl.* sweet-scented; corolla yellow, salver-shaped, the tube much longer than the calyx; cymes terminal, loosely trichotomous-corymbose. June. *l.* petiolate, lanceolate or elongated ovate-lanceolate, acuminate, rather obtuse at base, 3in. long. *h.* 4ft. Canaries, 1800. Greenhouse shrub. (B. R. 464.)

T. heliotropioides (Heliotrope-like). Summer Heliotrope. *fl.* the colour and shape of those of the common Heliotrope (*H. peruvianum*), but devoid of scent. May. *l.* elliptic, obtuse, pubescent on both sides, the margins undulated. Branches terete, and, as well as the petioles, hairy. *h.* 2ft. Buenos Ayres, 1829. Stove sub-shrub. (B. M. 3096.)

TOURRETIA (named in honour of Marc Antoine Louis Claret de la Tourrette, 1729-1793, a friend of Rousseau, and author of several botanical works). SYNS. *Dombeya, Medica.* ORD. *Bignoniaceæ.* A monotypic genus. The species is a hardy, climbing herb (or sub-shrub?), usually treated in gardens as an annual. Seeds should be sown, early in spring, on a hotbed. When the young plants are strong enough to handle, they may be planted in light soil, against a wall or pillar.

T. lappacea (Bur-like). *fl.* in long, spicate racemes, on terminal peduncles; calyx two-parted, deciduous; corolla purple-violet, with a very unequally bilabiate limb; stamens four, didynamous. July. *l.* opposite, di- or trichotomously divided; segments petiolulate, membranous, serrated; petioles produced into a branched tendril or leaflet. Branches slender, tetragonal. *h.* 6ft. Mountains of tropical America, 1788. (B. M. 3749.)

TOVARIA. A synonym of **Smilacina** (which *see*).

TOVOMITA (from *Tovomite*, the Caribbean name of *T. guianense*). SYNS. *Beauharnoisia, Marialva,* and *Micranthera.* ORD. *Guttiferæ.* A genus comprising about a score species of tropical American, stove trees or shrubs, with resinous juice. Flowers often rather small, cymose-umbellate or in dense panicles; sepals two or four; petals four to ten, imbricated, often twin-seriate; stamens indefinite. Fruit often obovoid-oblong or pyriform. Leaves penninerved. The three species introduced are handsome trees, thriving in a mixture of loam, peat, and sand. Ripened cuttings will root freely in sand, under a hand glass, in heat.

T. Choisyana (Choisy's). *fl.* yellow; sepals four, the two inner ones petaloid; petals eight to eleven; pedicels shorter than the flowers; male cymes terminal, few-flowered. May. *l.* oblong, acute at base, shortly and rather obtusely acuminate at apex, entire. *h.* 20ft. Cayenne, 1823. SYN. *Micranthera clusiæfolia.*

T. fructipendula (pendulous-fruited). *fl.* yellowish, on jointed pedicels; sepals two; petals four; peduncles filiform, axillary and terminal, two or three-flowered, elongated. January and February. *fr.* turbinate, pendulous, crowned by the permanent styles. *l.* oblong, acutely and sharply acuminate, 3in. long. *h.* 18ft. Peru. SYN. *Beauharnoisia fructipendula.*

T. guyanensis (Guiana). *fl.* dicœcious; sepals two; petals four, green; anthers white; pedicels jointed; peduncles corymbose, dichotomous, thick, terminal. June. *l.* ovate-oblong, bluntly acuminate, somewhat stem-clasping, coriaceous, 4in. to 5in. long. white beneath. *h.* 10ft. Guiana and Brazil, 1827. (A. G. 364.) SYN. *Marialva guyanensis.*

TOWN CRESS. A common name for **Lepidium sativum** (which *see*).

TOXICODENDRON (from *toxicon*, poison, and *dendron*, a tree; alluding to the poisonous nature of the fruits). SYN. *Hyænachne.* ORD. *Euphorbiaceæ.* A small genus (two species) of small, rigid, much-branched, greenhouse trees, endemic in South Africa. Flowers dicœcious, apetalous, axillary, the males densely cymulose and shortly pedunculate, or loosely racemose, the females solitary, shortly pedicellate. Capsule sub-globose, thick, hard. Leaves opposite or often whorled, entire, rigidly coriaceous. *T. capense,* the only species introduced, succeeds in well-drained, sandy loam. When at rest, water should be sparingly given. Propagation may be effected by cuttings, inserted in sandy soil, under a bell glass.

T. capense (Cape of Good Hope). *fl.*, male panicle about one-third the length of the leaves, slightly puberulous, cluster-flowered; bracts thick, ovate-lanceolate. June. *l.* sub-lanceolate, linear, narrowly oblong, or elliptic, cuneate-narrowed at base, rounded and obtuse at apex, paler beneath, glabrous. Flowering branches terete. *h.* 5ft. to 6ft. 1783. SYN. *Hyænachne globosa.*

TOXICOPHLÆA (from *toxicon*, poison, and *phloros*, bark; in allusion to the poisonous rind). SYN. *Acokanthera.* ORD. *Apocynaceæ.* A small genus (three species) of very poisonous, tall, greenhouse shrubs or small trees; two are natives of South Africa, and the third is Abyssinian. Flowers white, or pink on the outside, odorous; calyx five-parted, eglandular; corolla salver-shaped, with a cylindrical tube and five twisted lobes; cymes sub-racemose, dense, sub-sessile in the axils. Berry globose, one or two-seeded. Leaves opposite, thickly coriaceous, obliquely penniveined.

Toxicophlæa—*continued.*

The two introduced species thrive in a light, rich soil, with an occasional watering of weak liquid manure. Cuttings root readily under a hand glass, in moderate heat.

T. cestroides (Cestrum-like). A synonym of *T. Thunbergii.*

T. spectabilis (showy).* Wintersweet. *fl.* white, in terminal and axillary corymbs, which form a very large, dense spray, frequently over 2ft. in length; perfume sweet and powerful. Spring. *l.* elliptic. *h.* 4ft. to 6ft. South Africa, 1872. (G. C. 1872, 353; Gn. July, 1877; R. H. 1879, 270.)

T. Thunbergii (Thunberg's). *fl.* yellowish, tipped with brown, expanding in the afternoon; corymbs sessile, axillary, usually eight-flowered. February to April. *l.* lanceolate-oblong, coriaceous. *h.* 6ft. to 7ft. Cape of Good Hope, 1787. The correct name of this plant is now *Acokanthera venenata.* (I. H. 1885, 543.) SYN. *T. cestroides* (R. G. 940; R. H. 1880, 370).

TOXOSTIGMA. A synonym of **Arnebia** (which *see*).

TRACHEA (derivation uncertain). A small genus of Night-moths (*Noctuæ*), of which only one species, *T. piniperda,* or the Pine Beauty Moth, is found in Britain. The

FIG. 67. TRACHEA PINIPERDA.

size, form, and markings of the moth are shown in Fig. 67. The front wings are brick-red, or reddish-brown, mixed with grey and pale orange; there are darker oblique cross-lines, and whitish spots towards the middle of each wing, the centre of the larger spot being filled up with orange-grey. The moths fly in the early spring. The larvæ are slender; when full-grown, they are yellowish-green, with a white line down the middle of the back, and a double line (white above, and orange beneath) along each side above the legs. The young larvæ are of a uniform green colour. They feed on the leaves of Fir-trees during summer, and, when full-fed, spin slight cocoons in crevices of the bark, or under the soil, and in them become brown pupæ.

Where these Moths are conspicuously hurtful to Conifers, their numbers may be reduced by shaking them off the branches, and preventing them from ascending the trunk by putting a ring of tar around it. The pupæ also should be sought for in the crevices of the bark, and by turning up the soil around the trunks to a depth of three or four inches. This insect is, however, seldom so abundant as to do much harm in any part of Britain.

TRACHEA, TRACHENCHYMA. Spiral vessels; air-tubes, containing a spiral thread of considerable toughness and elasticity.

TRACHELIUM (from *trachelos*, the neck; alluding to the supposed efficacy of the plants in diseases of the trachea). Throatwort. ORD. *Campanulaceæ.* A small genus (four or five species) of hardy, perennial herbs or sub-shrubs, natives of the Mediterranean region. Flowers sub-umbellate or in a corymbosely-branched panicle; calyx tube adnate, the limb five-parted; corolla narrow-tubular, shortly five-lobed at apex; stamens free. Leaves exstipulate. Only one species calls for mention here. It thrives in a compost of sandy loam and vegetable mould. Increased by seeds, sown on a slight hotbed, in spring; or by cuttings of young shoots, inserted in sandy soil, in April, or at the end of summer.

T. cæruleum (blue). *fl.* small, very numerous, corymbose; corolla violet-blue, salver-shaped, with a long and very narrow tube. August. *l.* ovate, acute, deeply serrated, on short petioles. Stem erect. *h.* 2ft. Italy and Spain, 1640. (B. R. 72.)

T. c. album (white). This only differs from the type in having white flowers.

TRACHELOSPERMUM (from *trachelos*, the neck, and *sperma*, a seed; alluding to the apical elongation of the seeds). SYNS. *Parechites*, *Rhynchospermum* (of Lindley). ORD. *Apocynaceæ*. A small genus (four species) of stove or greenhouse shrubs, inhabiting the East Indies, the Malayan Archipelago, and Eastern Asia, extending as far as Japan. Flowers white, in loose, terminal or pseudo-axillary cymes; calyx small, five-parted, with five to ten glandular scales at base within; corolla salver-shaped, with a cylindrical tube, a constricted throat, and five oblong, twisted lobes; filaments very short; disk annular, truncate or five-lobed. Leaves opposite, scattered, penniveined. *T. jasminoides* is a pretty, greenhouse climber, of easy culture in a compost of light loam and peat. It may be readily increased by cuttings.

T. jasminoides (Jasmine-like).* *fl.* white, very fragrant, several in a cyme; corolla tube contracted below the middle, hairy within at the mouth, the lobes waved, with reflexed margins; peduncles solitary, axillary or terminal, much longer than the leaves. July. *l.* on very short petioles, ovate-lanceolate, acute, the younger ones pale yellow-green. Shanghai, 1846. SYN. *Rhynchospermum jasminoides* (B. M. 4737; J. H. S. i., p. 74; L. & P. F. G. ii. 147).

T. j. angustifolium (narrow-leaved). A form with smaller, narrower leaves than the type; it proves hardy when grown against a wall in the open air in the south of England. SYN. *Rhynchospermum angustifolium*.

TRACHYCARPUS (from *trachys*, rough, and *karpos*, fruit; probably in allusion to the rough, hairy fruit). ORD. *Palmæ*. A small genus (four species) of greenhouse or half-hardy, unarmed Palms; two inhabit the mountains of North India and Burmah, the third is Chinese, and the fourth Japanese. Flowers yellowish, small; spathes many, rather large, compressed, obliquely cut, thickly coriaceous, tomentose; spadices many, short or elongated, robust, densely or loosely flowered. Fruit yellowish, small, globose, ellipsoid, or sub-reniform, one-seeded. Leaves terminal, orbicular or semi-orbicular, deeply plicate-multifid; segments narrow, induplicately bifid; rachis none; ligule very short; petioles biconvex; sheath entire. Caudices solitary and tall, or dwarf and tufted. The species are of very easy culture in a compost of rich, strong loam, to which is added a small portion of vegetable mould and sand. Perfect drainage, and copious supplies of water throughout the summer, are most essential to success. Propagation may be effected by suckers, which generally appear in considerable quantities; or by seeds.

FIG. 68. TRACHYCARPUS EXCELSUS, in a Young State.

T. excelsus (tall).* *fl.*, spadix 1ft. long, duplicately branched; spathes membranous, fuscous, tubular, bifid at apex. *l.* in young specimens oblong, in adults transversely oblong, concave, digitately multipartite, 1½ft. in diameter; segments fifteen to sixty, linear, somewhat obtuse, bidentate or shortly bifid, the teeth or segments obtuse; petioles above loosely concave, below convex, 1½ft. long, the margins smooth or armed with small teeth. *h.* 24ft. China and Japan, 1844. See Fig. 68. (F. d. S. 2368.) SYN. *Chamærops excelsa*.

T. Fortunei (Fortune's).* *fl.* yellow; inflorescence densely paniculate, more than 9in. long. *l.* semi-orbicular, flabellate, 1½ft. long and broad, cut half-way or more down; segments ⅜in. to 1in. broad, pendulous towards their tips; petioles 1½ft. or more long, unarmed, or the margins very obscurely toothed. Caudex 8ft. to 12ft. high, the lower portion marked with the scars of fallen leaves. China, 1849. Hats, brooms, brushes, cordage, sandals, and whole dresses, are made, by the natives, of the fibrous sheaths of old leaves. (G. C. n. s., xxiv., p. 305.) SYN. *Chamærops Fortunei* (B. M. 5221).

T. khasyanus (Khasyan). *fl.*, spadix 2ft. long, the lower half concealed by the spathes, of which there are three; branches of the spadix exserted, quite naked. *l.* flabelliform, reniform, 2ft. long, 3½ft wide; segments about sixty-five, the lateral ones shortest, 12in. to 14in. long, but more deeply divided than the others, linear, their segments 2½in. to 3in. long, narrow, acute; petioles 1½ft. long, with irregular, denticulate margins. Trunk 5in. in diameter. *h.* 9ft. Khasya Mountains. SYN. *Chamærops khasyana*.

T. Martiana (Martius'). *fl.*, spadices many, in adults much-branched, spreading, many-flowered. *fr.* ovate, sub-solitary, lepidoted. *l.* palmately multifid; segments bifid at apex; sheath cylindrical, obliquely truncate. Caudex 26ft. high, cylindrical above, 4in. to 6in. in diameter, fusco-cinereous, marked with the scars of fallen leaves. Himalayas. SYN. *Chamærops Martiana*.

TRACHYMENE (from *trachys*, rough, and *hymen*, a membrane; alluding to the channels of the fruit). SYNS. *Didiscus*, *Huegelia*. ORD. *Umbelliferæ*. A genus comprising about fourteen species of stove or greenhouse, annual or perennial herbs; one inhabits New Caledonia, another Borneo, and the rest are endemic in Australia. Flowers white or blue, in simple umbels; calyx teeth minute or obsolete; petals entire, obtuse, imbricated; involucral bracts linear, often connate. Leaves ternately dissected or rarely undivided, toothed; stipules wanting. *T. cærulea*, the only species worth describing in this work, is a rather coarse, erect, more or less hirsute, greenhouse annual or biennial. It should be raised from seeds, sown on a gentle hotbed.

T. cærulea (blue). *fl.* usually blue; petals unequal; involucral bracts numerous, linear; peduncles long, each bearing an umbel of very numerous flowers, 1in. to 2in. in diameter. July. *l.* once or twice tripartite; lobes linear-cuneate, trifid or incised, acute; upper floral leaves small, simple or trifid. *h.* 1ft. to 2ft. West Australia, 1827. (B. R. 1225.) SYN. *Didiscus cæruleus* (B. M. 2875).

TRACHYMENE (of De Candolle). A synonym of **Siebera** (which *see*).

TRACHYNOTIA. A synonym of **Spartina** (which *see*).

TRACHYSTEMON (from *trachys*, rough, and *stemon*, a stamen; alluding to the villous filaments of one of the species). SYNS. *Nordmannia*, *Psilostemon*. ORD. *Borragineæ*. A genus including only a couple of species of hardy, erect, branched, hispid, perennial herbs, found in the Orient. Flowers pink or white, pedicellate; calyx five-cleft; corolla tube cylindrical, five-scaled within, the five lobes linear, spreading, or at length revolute; stamens five; cymes rather loose, bundle-flowered. Nutlets four, erect. Radical leaves often ample, long-petiolate; cauline ones few, alternate. *T. orientalis*, the only species calling for description here, thrives in ordinary soil; it may be multiplied by seeds, or by divisions.

T. orientalis (Eastern). *fl.* purplish-blue, copious, on long pedicels; corolla lobes revolute, pilose outside at the apex. March to May. *l.* hispid, broad; lower ones cordate; upper cauline ones ovate-lanceolate, narrowed at base. Stem hispid. *h.* 1ft. to 2ft. 1752. (G. C. n. s., xiv., p. 17.) SYN. *Borago orientalis* (B. R. 288; S. F. G. 175).

TRACHYTELLA. A synonym of **Delima** (which *see*).

TRADESCANTIA (named in honour of John Tradescant, gardener to Charles I.; he died in 1638). Spiderwort. SYN. *Ephemerum*. Including *Descantaria*, *Pyrrheima*. ORD. *Commelinaceæ*. A genus comprising about thirty-two species of stove, greenhouse, or hardy, perennial herbs, natives of North and tropical America. Flowers more or less pedicellate, numerous or few in a cyme, very rarely solitary; sepals distinct, concave, green or coloured; petals distinct, obovate or orbicular, sub-equal; stamens six,

Tradescantia– *continued.*

all usually perfect; cymes simple, variably disposed. Leaves variable. Stem simple or branched, diffuse, ascending, or erect. The best species are here described. They are amongst the easiest of plants to cultivate. Cuttings of the stove and greenhouse species root readily at almost any season, if inserted in light soil, in moderate heat. The hardy Tradescantias, of which *T. virginica* is one of the best, may readily be propagated by division; the plants succeed in ordinary garden soil.

T. caricifolia (Sedge-leaved). A synonym of *T. virginica.*

T. crassifolia (thick-leaved). *fl.* resembling those of *T. virginica;* sepals whitish, woolly; petals purplish-rose or blue; umbels three to six on a branch, sessile, axillary, the upper with two bracts, the lower with one. August. *l.* ellipsoid or narrow-lanceolate, woolly-villous beneath. Stem scarcely divided. Root a large tuber. *h.* 2ft. Mexico, 1796. Half-hardy. (B. M. 1598.)

T. c. acaulis (stemless). Stem shorter or scarcely any. (B. R. 1840, 34, under name of *T. iridescens.*)

T. c. glabrata (glabrous). *fl.*, sepals white-woolly. *l.* glabrous on both sides, the margins white-woolly. SYN. *T. speciosa.*

T. crassula (rather thick). *fl.*, sepals hairy-pilose; petals white; umbels many-flowered, loose, mostly terminal, rarely also one or two in the axils; pedicels glabrous. July. *l.* oblong, rather obtuse, 4in. long, glabrous, ciliated-pilose on the margins. Stem glabrous, sub-corymbosely branched. *h.* 1½ft. Brazil, 1825. Stove. (B. M. 2935; L. B. C. 1560.)

T. discolor (discoloured). A synonym of *Rhoeo discolor.*

T. elata (tall). A synonym of *T. virginica.*

T. erecta (erect). A synonym of *Tinantia fugax erecta.*

T. fuscata (fuscous). *fl.*, sepals rather thick, densely rusty-hairy outside; petals bluish-purple, round; peduncles axillary, crowded, one to three-flowered. September. *l.* 6in. to 8in. long, oblong, acute, scarcely acuminate, narrowed or attenuated at base, more or less petiolate. Stem short or scarcely any, clothed with dark sanguineous hairs. Brazil, 1820. Stove. (B. M. 2330; B. R. 482; L. B. C. 374.) SYN. *Pyrrheima Loddigesii* (of gardens).

T. glabra (smooth). A synonym of *T. virginica.*

T. iridescens (iridescent). A synonym of *T. crassifolia acaulis.*

T. latifolia (broad-leaved). A synonym of *Tinantia fugax erecta.*

T. multiflora (many-flowered). *fl.*, sepals ovate, hairy, equalling the white petals; umbels terminal and axillary; peduncles hairy, shorter than the leaves. June. *l.* ovate, sub-cordate-rounded at base, pointed, 1in. to 2in. long. Stem ascending. Jamaica, 1824. Stove. SYN. *T. procumbens.*

T. navicularis (boat-shaped). *fl.* similar to those of *T. virginica;* petals of a beautiful pink, twice the length of the navicular sepals; umbel terminal, solitary, many-flowered. Summer. *l.* ¾in. long, sessile, fleshy, navicular, ovate, acute, ciliated on the margins, very thickly dotted beneath. Stem stoloniferous at base, scarcely branched; floriferous branches geniculate-ascending. Peru. Stove. (R. G. 901.)

T. pilosa (pilose). A synonym of *T. virginica pilosa.*

T. procumbens (procumbent). A synonym of *T. multiflora.*

T. pulchella (pretty). *fl.*, sepals and pedicels nearly glabrous; petals rose-coloured or bluish. July. *l.* elliptic-lanceolate or lanceolate, sessile, 2in. long, acute, often rounded and somewhat stem-clasping at base, glabrous. Stem procumbent; branches sub-erect, glabrous. Mexico, 1825. Greenhouse.

T. rosea (rose-coloured). *fl.* ½in. in diameter; petals bright rose-coloured, three times as long as the ovate-lanceolate sepals; cymes solitary or in pairs, few-flowered; peduncles terminal, 3in. to 6in. long. June to August. *l.* linear-lanceolate, fringed on the margins. Stem simple, slender, smooth, 6in. to 8in. high. North Carolina, 1802. Hardy. (L. B. C. 370; S. B. F. G. 183.)

T. speciosa (showy). A synonym of *T. crassifolia glabrata.*

T. sub-aspera (rather rough). A synonym of *T. virginica.*

T. tumida (tumid). A synonym of *T. virginica tumida.*

T. undata (waving). A synonym of *Tinantia fugax erecta.*

T. velutina (velvety). *fl.*, sepals and pedicels softly pubescent; petals purplish-rose; umbels terminal and axillary, many-flowered. May. *l.* 5in. long, sessile, oblong-lanceolate, acute, densely and softly pilose above, very shortly silky-villous beneath. Stem branched, softly whitish-villous. *h.* 1½ft. Guatemala, 1850. Stove.

T. virginica (Virginian).* Flower of a Day; Common Spiderwort. *fl.* 1in. in diameter, closely packed in two rows in the bud, each with an ovate, scarious bract at the base; petals violet, purplish, or whitish, like the style and densely-bearded filaments, twice as long as the lanceolate-ovate sepals; cymes axillary and terminal, sessile, many-flowered. March to May. *l.* linear, broadest at base, mostly purple-veined. Stems 6in. to 2ft. high. Florida and northward, 1629. Hardy. (B. M. 105.)

Tradescantia—*continued.*

SYNS. *T. caricifolia* (B. M. 3546), *T. elata* (L. B. C. 1513), *T. glabra*, *T. sub-aspera* (B. M. 1597). Of this species there are several varieties.

T. v. alba (white). A variety having white flowers. (B. M. 3501.)

T. v. pilosa (pilose). *fl.*, upper umbels many, sessile in the axils of the leaves; lower ones pedunculate, with two lanceolate-linear bracts. (B. R. 1055.) SYN. *T. pilosa* (B. M. 3231).

T. v. tumida (tumid). *fl.*, umbels sessile in the axils. Stem thickened. SYN. *T. tumida* (B. R. 1840, 42).

FIG. 69. TRADESCANTIA WARSCEWICZIANA.

T. Warscewicziana (Warscewicz's). *fl.* many, densely crowded in a branched panicle; sepals and pedicels lilac; petals purple. May. *l.* narrow-oblong, about 8in. long, acuminate, sessile. Stem robust, erect, 4in. to 16in. high. Guatemala. Stove. See Fig. 69. (B. M. 5188.)

T. Zebrina (Zebrina). A synonym of *Zebrina pendula.*

TRAGACANTH GUM PLANT. *See* **Astragalus Tragacantha.**

TRAGIA (named in honour of Jerome Bock, 1498-1554—generally called Tragus, the Greek for Bock [Buck]—a German botanist). ORD. *Euphorbiaceæ.* A large genus (about fifty species) of stove herbs or sub-shrubs, inhabiting warm regions. Flowers monœcious, apetalous, racemose. Leaves alternate, petiolate, toothed or lobed. The species, a few of which have been introduced, possess no beauty, and are not particularly interesting.

TRAGIUM. Included under *Pimpinella.*

TRAGOPOGON (from *tragos*, a goat, and *pogon*, a beard; alluding to the long, silky beard of the seeds). Goat's Beard. Including *Geropogon.* ORD. *Compositæ.*

Tragopogon—*continued.*

A genus of hardy, biennial or perennial herbs, natives of Europe, North Africa, and temperate and sub-tropical Asia. About forty species have been described, but the number may be considerably reduced. Flower-heads yellow or blue (or purple ?), terminal, homogamous; ray florets ligulate, truncate, five-toothed; involucre cylindrical or narrowly campanulate, the bracts one-seriate, often much elongated; receptacle flat or at length convex, foveolate; achenes glabrous or slightly hispid; pappus bristles indefinite, one-seriate. Leaves alternate, linear, entire, amplexicaul, often grass-like. A selection of the introduced species is given below. Seeds only require to be sown in ordinary garden soil.

T. crocifolius (Crocus-leaved). *fl.-heads* violet, on terete peduncles; involucre five or six-leaved; achenes muricate-scabrous. June. *l.* narrow-linear, straight. *h.* 1ft. Italy, 1739. A glabrous biennial.

T. glaber (smooth).* *fl.-heads* purplish, solitary at the slightly-thickened tips of the stems or branches; involucre eight-leaved, as long as the rays. July. *l.* elongated, half-amplexicaul. Stem simple or rarely branched, terete. *h.* 1½ft. South Europe, 1704. A glabrous biennial. SYN. *Geropogon glaber* (B. M. 479).

T. major (greater). *fl.-heads* yellow; involucre of twelve to fifteen scales, the outer ones exceeding the ray florets; peduncles obconical-fistulose at apex. May. *l.* straight, lanceolate-linear, acuminate. *h.* 5ft. Austria, 1788. A glabrous perennial. (J. F. A. 29.)

FIG. 70. TRAGOPOGON PORRIFOLIUS.

T. porrifolius (Leek-leaved). Salsafy; Vegetable Oyster, &c. *fl.-heads* rose-coloured or flame-purple; involucre of eight scales; peduncles obconical-fistulose at apex. May and June. *l.* straight, lanceolate-linear, acuminate, the sheaths slightly dilated. *h.* 3ft.

Tragopogon—*continued.*

North Europe (naturalised in England). A glabrous biennial. See Fig. 70. (Sy. En. B. 801.) For culture, &c., *see* **Salsafy.**

T. pratensis (meadow-loving). Common Goat's Beard; Noonflower; Shepherd's Clock; Star of Jerusalem, &c. *fl.-heads* yellow, ¾in. to 2in. in diameter; involucre obconical, of about eight bracts, often streaked with brown; scapes scarcely thickened upwards. June and July. *l.* flexuous, gradually contracted upwards; radical ones channelled above. Stems stout, erect, 1ft. to 2ft. high. Europe (Britain). Plant glabrous, or the involucre slightly cottony. Biennial. (Sy. En. B. 798-800.)

T. roseus (rose-coloured). A synonym of *T. ruber.*

T. ruber (red). *fl.* rose-coloured or diluted with purple, on terete peduncles; involucre of about eight bracts. May. *l.* lanceolate-linear, slightly undulated, glaucous. Stems erect, leafy, glaucous. *h.* 1½ft. Siberia, 1826. Young plant cobweb-woolly. Perennial. SYN. *T. roseus.*

TRAILERS. *See* **Creepers.**

TRAINING. This term, as used in gardening, refers to the management of trees and plants, more especially when in a young state, by regulating their branches to give all a fair amount of space and exposure to light. Many trees and plants, if allowed to grow in a natural way, would assume proportions far beyond the limited accommodation which is available for them when under cultivation, and, besides, would be crowded and unfruitful. Pruning is first of all necessary, but with it Training is closely associated; the branches that are reserved either temporarily or permanently, when pruning, have afterwards to be dealt with in a similar manner in Training. Besides disposing of branches to give all plenty of space and light, there is also the necessity for regulating them, so as to prevent the sap flowing to any one branch, or part of the plant, at the expense of another, and to the detriment of both. An unequal flow of sap causes overluxuriance in one part, and weakness in another. By Training, much of this irregularity may be prevented; in fact, it is one of the principal objects to be kept in mind. It is pretty generally known, by persons engaged in gardening pursuits, that sap will flow most readily into straight branches, which pass from the root in an upright, or nearly upright, direction, and not so freely into others proceeding obliquely or horizontally from the same starting-point. If, therefore, a tree, which it is desired should be about equally strong in all its branches, shows—as naturally it will do if not attended to—a disposition to

FIG. 71. FAN TRAINING.

grow irregularly, it must be corrected at an early stage. This constitutes one of the principal objects which may be effected by Training. The fact of sap flowing most forcibly into branches trained in an upright direction, supplies the means, as by elevating or depressing the points during the growing season, according to vigour shown, the circulation may be encouraged, or checked, in a most marked manner, and the development will be more generally alike throughout.

In the management of cultivated trees, several methods of Training are adopted, some kinds, and also some

Training—*continued.*

positions, being better adapted for one than for another. Fruit-trees are those more especially referred to; it is an easy matter to train annual climbers, both indoors and out, if only the necessary requirements of the plant are kept in view. The same may also be said of creepers or trailers generally, when their shoots are sufficiently thinned out. The methods of Training a plant to a rafter, on a wire trellis, or round a certain number of sticks, are matters which scarcely need an explanation.

The principal methods of Training adopted for wall-fruit trees are the Fan, Horizontal, Oblique, and Cordon, all being subject, more or less, to modifications; for the open ground, Pyramids, Bushes, and Standards are the shapes most favoured. Fan Training is generally adopted for stone fruits—Apricots, Cherries, Peaches, and Plums. The trees may be worked on dwarf or tall stocks, but on the latter the system is often modified by bringing some of the branches down on either side of the stem when there is space.

Fan Training must be commenced on maiden trees, that is, trees which have been worked the previous year and have made one strong shoot. This is cut down nearly to the point of union, in order to induce the production of shoots therefrom to eventually form the principal branches. One of the chief conditions to be aimed at in Fan Training is to get the head equally balanced, by having the same number of shoots on one side of the centre as on the other, as shown, for example, in Fig. 71. If sufficient can be secured the first year for starting an evenly-balanced head, an advantage is gained which the tree will always show afterwards. Should a young tree start irregularly, and misplaced shoots be allowed to develop for a season, it is not an easy matter then to secure others where they are wanted from the base. Sometimes, trees are cut hard back a second time, but this is a most objectionable practice; the less severe cutting is resorted to, the better, as it invariably leads to branches dying away sooner or later. By regulating the young shoots, depressing the stronger and elevating the weaker ones, much may be done to equalise the flow of sap, and render them all of about equal dimensions at the end of the season. In this and in other systems of Training, much has to be known by the operator from practical experience in the work, and constant attention is necessary from the first, to keep the shoots properly

FIG. 72. FAN TRAINING.

disposed and the sap regulated. Fig. 72 represents a tree trained without a centre shoot; the sap in such a tree would be equally distributed on both of the sides, and it is a comparatively easy matter to get the centre filled up when once the sides are equalised and the main branches established.

Horizontal Training is largely employed for Pear-trees, and sometimes for Apples that are to be grown against

Training—*continued.*

walls or as Espaliers in the open ground. Espalier trees are sometimes trained on horizontal wires, as shown in Fig. 73. When there is a great length, and in a straight line, wires are preferable to stakes, if only for their durability. A young tree with a single upright stem is cut

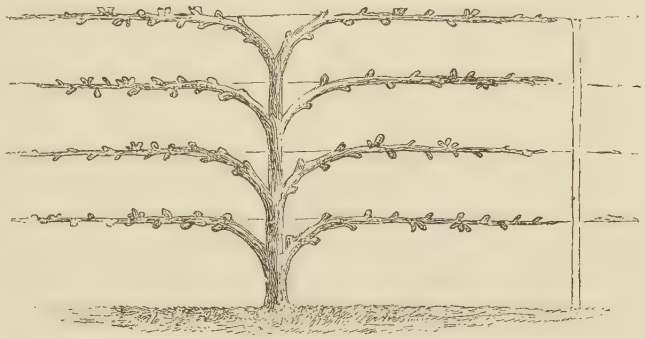

FIG. 73. HORIZONTAL TRAINING FOR ESPALIER TREES ON WIRES.

down to about 12in. from the ground, provided there are three buds situated near that point, one on either side, and one in an eligible position for growing to form the leader. The two side shoots should be trained on an angle for the first year, and induced to grow, if possible, with equal vigour; they can afterwards be

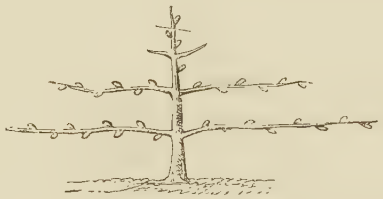

FIG. 74. HORIZONTAL TRAINING.

gradually brought down to a horizontal line, to form bottom branches. At pruning time the next year, the leader is again cut down immediately above three other buds similarly situated as in the first year, but some 10in. or 12in. higher up, according to the distance required between the horizontal branches. Thus the work proceeds each year (as shown in Fig. 74); every pair of branches is

FIG. 75. HORIZONTAL TRAINING.

Training—*continued.*

therefore, in an established tree, a year older than the pair situate immediately above. Unfortunately, it is not safe to attempt more than one step up each year, although, with vigorous trees and a good climate, two may occasionally be secured by stopping the centre shoot in summer

FIG. 76. SINGLE OBLIQUE CORDONS.

at the proper distance up, and training the laterals. This is not recommended, as it cannot be expected that a lateral from a young shoot will ever mature and form a branch equal in strength to another which starts from a ripened bud. Some prefer Training the branches on either side, so that they come alternately (see Fig. 75);

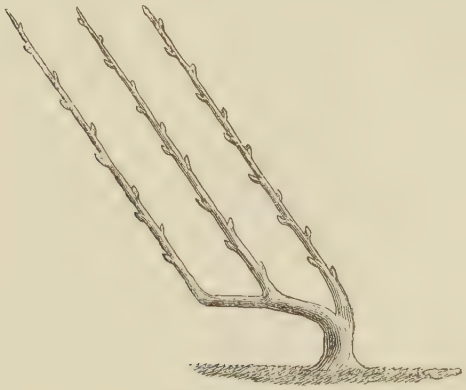

FIG. 77. TREBLE OBLIQUE CORDON.

but it is not always certain that every branch can be secured just at the point where it is wanted to insure alternate regularity.

In Oblique Training, a centre stem is reserved as in the Horizontal method; but the side branches are allowed to point upwards, instead of being kept to a level. This

FIG. 78. DOUBLE HORIZONTAL CORDON.

allows a freer circulation of sap, for the reason which has been already explained: the system, therefore, favours weak-growing sorts, and may be adopted with success for Peaches and Nectarines, where the Horizontal would not answer.

Cordon Training admits of a large number of trees being cultivated in a comparatively small space. Apples, Pears, and Cherries, the fruits of which are borne on small spur branches, are specially adapted for Training as Cordons. They need but little room, as the branches may

Training—*continued.*

be kept pinched back during summer. Single Cordons consist only of a single stem, which may be formed from a strong maiden tree. These may often be planted about 2ft. apart, and trained obliquely, as shown in Fig. 76. Other oblique forms of Cordons are trained with two, or even three stems (as in Fig. 77). Horizontal Cordons are best adapted for training along the sides of walks, or to form an edging or boundary to fruit-tree quarters, &c. The method of Training a Double Horizontal Cordon

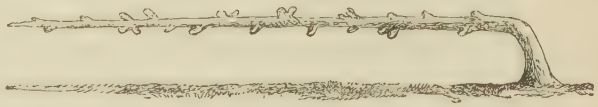

FIG. 79. SINGLE HORIZONTAL CORDON.

is shown in Fig. 78, and the Single, which is necessary for the ends, or where there are intersecting walks, in Fig. 79.

Pyramid Training is available for Pears, Apples, and Plums, also Cherries for pot-culture, and for outside in places where they can be depended upon to succeed away from a wall. There are several modifications of Pyramid Training, that most generally seen being an upright stem furnished with branches from bottom to top, which vary

FIG. 80. PYRAMID TREE.

in length, so as to form a pyramidal outline (see Fig. 80). The branches require regulating and stopping, as the trees grow, to keep a free circulation amongst them; and to

Training—*continued.*

obtain good specimens it is necessary to adopt a considerable system of Training in the early stages, by tying branches to fill up blanks, depressing the points of

FIG. 81. PYRAMID TRAINING, WITH BRANCHES BENT DOWNWARDS.

vigorous shoots, and encouraging weaker ones to grow more freely. When Pyramids are inclined to grow

FIG. 82. BUSH TRAINING.

Training—*continued.*

unduly strong, and make long shoots in place of fruiting spurs, a method of tying or bending down the points of the branches may be practised with advantage, on some of the strongest only, if this is considered sufficient. The

FIG. 83. STANDARD TREE.

tree would then appear as in Fig. 81, a habit which is sometimes naturally assumed by large pyramid Pear-trees of some varieties. Bush trees are practically Pyramids with the leader taken out; they need but little in the

FIG. 84. HALF-STANDARD TREE.

way of Training beyond thinning to prevent overcrowding. Bush-trained trees (see Fig. 82) of Apples and Pears, the former worked on the Paradise-stock, and the latter on the Quince, are especially adapted for small gardens:

Training—*continued.*

they are usually very productive, and require but little space.

Standard Training is best suited for orchards, market gardens, &c., where grass is grown beneath, and cattle or sheep feed thereon, or where other crops and bush fruit-trees are cultivated amongst them. There is no great necessity for Training Standard trees artificially; their heads develop evenly enough, as a rule, if they are kept sufficiently thinned, after being shortened back for the first year or two to get the foundation. Standard

FIG. 85. VERTICAL OR UPRIGHT TRAINING.

Training (see Fig. 83) is suitable for Apples, some kinds of Pears, Plums, and Cherries, in favoured localities. A Half-Standard (Fig. 84) is simply a Standard with a shorter stem.

Vertical or Upright Training requires a considerable amount of management in keeping the upright shoots

FIG. 86. APPLE-TREE TRAINED VASE-SHAPE, WITH DWARF STEM AND UPRIGHT BRANCHES.

Training—*continued.*

regulated and the tree evenly balanced. Two shoots must first be trained horizontally, and their points turned to form the uprights at the extreme ends (see Fig. 85). These must be kept in advance of all the others in the Training process; the centre will then be the last part of the tree to be furnished. This system is not so widely practised as others which have been already noticed.

Apple-trees trained in the shape of a vase, with dwarf stem (see Fig. 86), are very ornamental for lawns, &c., apart from the value of the fruit which is generally produced by them when established and kept pruned annually.

References to the methods of Training adapted to the various kinds of fruits named may be found under **Cherry, Currant, Fig, Gooseberry, Nectarine, Pear, Plum, Vine,** &c.

TRAMETES (from *trama*, the layer in *Hymenomycetes* that supports the hymenium, or spore-bearing surface on each side of it, in the gills or in the partitions between the pores). A genus of Fungi nearly allied to **Polyporus** (which *see*), from which, indeed, it differs in little save that in *Trametes* the substance of the trama is similar to that of the pileus, while in *Polyporus* it is different. The general form of the Fungi in the genus, and the situation and appearance of the pores in which the hymenium is situated, are well exemplified in *T. Pini*

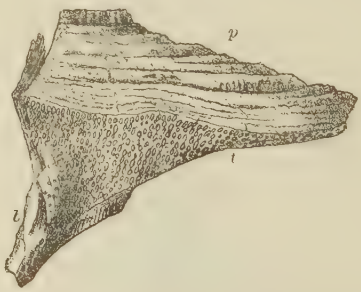

FIG. 87. TRAMETES PINI, showing (*p*) Pileus and (*t*) Openings of Spore-bearing Tubes. *b*, Bark of Fir-tree.

(see Fig. 87). Nine species have been discovered in Britain, growing on various trees and shrubs, but all rare. *T. Pini* is, however, by no means rare on the Continent, where it sometimes does great injury to living Conifers, chiefly to Pines and Larches, but also frequently to Spruces, and less often to Silver Firs. In these trees it produces a condition known as the "Red Rot." The reproductive organs of the Fungus grow out of the sides of the trees, as rusty-brown masses of the form figured, and are from 3in. to 6in. across; and they continue to slowly increase in size for a long time. The wood is destroyed by the action of the mycelium of the Fungus. The other species of *Trametes* are not very hurtful. Hartig's *T. radiciperda* is a synonym of *Polyporus annosus*, which is a most dangerous foe to Conifers, and also, though less often, to dicotyledonous trees, destroying the roots and trunks.

Remedies. The treatment required is similar to that recommended for **Polyporus.**

TRANSPLANTING. The act of removing any plant or tree from one situation, and transferring it to another, lifting it bodily, and placing the roots in new soil. The operation is one which is of the greatest practical utility, and is in daily practice on a most extensive scale. Because of the possibility of Transplanting, seedlings may be raised in immense quantities in a comparatively small space, and carefully tended in the younger stages of growth; plants and trees that are gradually developing may be lifted, and allowed additional

Transplanting—*continued.*

space according to their requirements; and others, with some few exceptions, that reach a considerable size, may, with proper appliances, be transferred to particular situations for producing an immediate effect. Transplanting forms one of the chief divisions of labour in nurseries, where, by its aid, thousands of plants are being continually prepared, in a limited area, for dispersing, eventually, over hundreds of acres of land. Fruit-trees may also be prepared in any quantity in nurseries, and grown, if desired, into a size large enough for bearing, when, at the proper season, they may be safely lifted and despatched for planting elsewhere, in private and other establishments.

In private gardens, Transplanting of seedlings of various descriptions and sizes forms part of the routine work, more or less, all the year round, but more especially in spring and early summer. Amongst the most important points to consider are the proper seasons for performing the work successfully, the previous preparation of the ground, and also the plants, if necessary, the operation of lifting, conveying to the new situation, and replanting, and after-management until the roots have re-established themselves. It scarcely need be said that considerable knowledge of the subject, and the exercise of much judgment and care, are necessary for Transplanting on an extensive scale, and with success. Some of these provisions are always essentials in the management of every garden. It is next to impossible to lift a plant that has been growing in the ground, and place it again in soil elsewhere, without cutting or breaking some of the roots, which, at least in a young state, are invariably tender in nearly every kind of tree and plant. In some cases this is comparatively unimportant—it may even be advantageous—but in others it may be quite the reverse. Sometimes, the spongioles, which extract nourishment from the soil, are numerous, and if a few become injured, there are plenty left for sustaining the plant; in other instances, there are but few, and then a greater risk is incurred. The proper season for Transplanting depends upon the kind of plant. Seedlings of vegetable crops, and tender or half-hardy plants raised under glass, generally need inserting into new soil soon after they become large enough to handle, in order to allow each individual more space and to prevent injury from overcrowding. The operation may have to be repeated, in some instances, two or three times before the permanent positions are reached; but, as a rule, it is with such plants one of the easiest performed, the chief precautions requisite being a good watering and shade for a few days, should it be necessary. Transplanting is, however, always best performed in dull, mild, and preferably damp weather: there is then less evaporation going on, and the ground is usually in better condition for working. Dry weather is not favourable for the work; it is important to watch opportunities, and never to lift plants until the new situation has been prepared for receiving them. The act of pricking out seedlings and frequently removing plants when in a young state, so far as may be consistent with their well-being, causes an increase of roots and also keeps them closer to the base. This is an advantage, inasmuch as every operation renders success in any subsequent Transplanting more certain, because of its effect in preventing an unlimited extension of the main spongioles. Beyond the recommendation that all seedling plants raised under glass and in seed-beds, for growing out of doors, should be moved, so far as possible, only when the weather is favourable for a quick renewal of growth, little further need be said here respecting them. Root action takes place most quickly when the soil is light; it is therefore a good plan generally to provide a light compost for seedlings, even if they require to be transferred into a heavier one when more fully developed.

Transplanting—*continued.*

The Transplanting of fruit-trees, ornamental and forest-trees, and shrubs of every description, into what may be considered more or less permanent quarters, forms annually a very important undertaking in many establishments, particularly when alterations are taking place, and new gardens or grounds are being laid out. As the usual sources of supply are the nurseries, the trees have often to be forwarded a long distance before reaching their destination. This not unfrequently has an injurious effect if the soil falls away when unpacking, or the roots become dry from a certain amount of exposure, which is often unavoidable. There is a vast difference between Transplanting trees or shrubs from one place to another in the same garden, and procuring them from a nursery. In the former case, the roots need only be exposed for a very short time if the work is properly managed, and, providing the weather is favourable, it may be conducted at seasons when long exposure would entail certain loss. Frequent Transplanting in the nursery keeps, as already noted, the roots close home, and this renders lifting and packing a more successful process than it otherwise would be. Trees and plants of any description should never be longer on a journey than is really necessary; they should be unpacked immediately on reaching their destination, and, if they cannot be immediately planted in their new quarters, the roots should be covered with soil. Root action may, and doubtless does, in many subjects, recommence gradually, very soon or directly after the work of Transplanting is completed: hence the importance of placing trees or plants at once in permanent positions, to prevent further disturbance.

The methods of Transplanting vary considerably in detail, according to different plants, and the manner in which their roots are naturally disposed. Some are deep, others shallow-rooting; and at times it is desirable, as in the case of some fruit-trees, to check the natural tendency when Transplanting, and to place roots in a horizontal direction, instead of allowing them to proceed downwards. There are some directions which are generally applicable, and these may be briefly referred to; the special details attending the management of individual plants or kind of trees can only be given in dealing with their cultivation separately. Usually, the hole should be first prepared, unless there are two sets of workmen—one digging holes, and the other lifting the plants. The requisite breadth and depth depends on the quantity and length of roots, but plenty of space should be allowed to spread them at full length, and to work readily all round. If the top soil is of better quality than that beneath, it may be placed on one side of the hole and mixed with some new, if the plant requires it. The bottom of the hole should be well broken up, and raised a little in the centre under the base of the plant. Having thus far prepared the hole, the plant may be placed in position, and the roots spread out evenly. It is best to ascertain first if the depth is all right, by laying a rod or drawing a small line across the top, taking a fair level on both sides. On no account should tree-trunks be buried, though they may be kept slightly lower than the ground level, in order that water may readily pass to the roots. A rod or line laid close to the trunk will show immediately if it is necessary to raise or lower the base, and any alteration can soon be made before filling in. Carefully spread out all the roots with the hand, and, should there be any hollow places beneath, fill in some soil to insure a firm resting-place. All soil that is placed in contact with the roots, both beneath and above, should be rather fine, and in a friable condition; this is very important, as hard lumps, or anything of too heavy a nature, would not fill up the cavities satisfactorily. Once the roots are arranged and covered, the holes may be filled up and trodden sufficiently, as the work proceeds,

Transplanting —*continued.*

to render the whole firm. All trees that are of sufficient height to be blown about and injured by rough winds, should be securely staked so soon as transplanted, or supported in some way, for preventing injury to the roots which would be caused were the trees allowed to sway about. In the case of standard or tall trees, transplanted for immediate effect, or for fruit-bearing, two or three guy ropes prevent this most effectually, and they may frequently be dispensed with so soon as the roots re-establish themselves. When lifting a tree for Transplanting, it is best to tie up with some soft cord any branches that may be near the base, and to commence digging out a spit of soil outside the line to which it is calculated the roots will reach. Then use a fork from the base of the tree outwards to separate the roots, but preserve as large a ball of earth as may be convenient to move, unless the tree is of a sort which transplants readily with bare roots. All roots which become mutilated had better be cut clean off before replanting; also any small ones, which sometimes die back—as, for instance, when trees have to be sent on a long journey. The necessity for watering depends very much on the season and the nature of the soil; if the subsoil is gravelly, a heavy watering would seldom do any harm, and water is the best of all substances for consolidating the top soil and roots. Watering is not so requisite in autumn as in spring Transplanting; but attention must be given to the subject throughout the summer immediately following. A mulching of loose litter or light manure, placed above the roots for a season, tends greatly to prevent evaporation, and to keep them moist even in dry weather.

The foregoing remarks are generally applicable to the Transplanting of any fruit and forest-trees, also all shrubs of moderate size that are amenable to the operation. The best seasons for performing the work, like other details, vary with individual subjects; some will transplant successfully at almost any season when carefully managed, while others are best moved at one particular period of the year. As a rule, all deciduous trees and shrubs transplant best in the autumn as soon as most of their leaves have fallen. These, and also Conifers and shrubs of all kinds, may generally be moved with safety any time during October, and up till the middle of November. There is then sufficient warmth in the soil to encourage the production of new roots before winter, and this is of great advantage. Transplanting may be proceeded with all through the winter whenever the weather is favourable; but the seasons when there is a certain amount of activity—as October and the early part of November, already mentioned—and a period immediately preceding the resumption of active growth in spring (February and March), are preferable. From the middle of November till the middle of January is the worst period for Transplanting, as vegetation is then so inactive, and the temperature of the ground very low. This period should not, therefore, be chosen by anyone who has but a moderate amount of the work to perform in any one season. Evergreen plants may be successfully moved later in the spring than deciduous ones, and Hollies transplant better in May, just as new growth begins, than at any other season. Rhododendrons may best be moved in March, or early in April. Such plants as half-hardy annuals, raised under glass for flowering in the open borders, are best transplanted into permanent positions before their flower-stems show; and hardy perennials which require division should be attended to in spring, before the annual growth is begun. Naturally, anything which is growing in a pot may be planted out in the open at periods when it would often be hazardous to attempt lifting the same individual from the ground. Transplanting in its entirety is therefore a subject the details of which have an extremely wide application;

Transplanting—*continued.*

the after-success will generally well repay for close attention to detail when performing the work. Briefly, the principal points are these: Lift the roots with the least possible injury, make the new holes sufficiently wide that all may be spread at full length; and, after regulating them with the hand, cover with soil that is in a good, workable condition. Avoid having any roots doubled underneath—when the tree is placed into its new position this must be guarded against—and secure the stem from rocking about with the wind afterwards. Give a copious watering soon after planting, or at a future period, according to the season and state of the soil, to consolidate all the earth which has been moved, and to supply moisture, of which the roots will be in special need, to enable them to re-establish themselves.

Transplanting of trees and shrubs of an unusual size is practicable by the use of mechanical means and plenty of strength. For filling up a blank in any important place, such as an avenue, or for planting with a view to producing an immediate effect, the work is sometimes undertaken, though, of course, under more or less exceptional circumstances. The trees must first be at hand, or be procurable within reasonable distance for removing, and they must be of a nature likely to transplant successfully with due care and previous preparation if necessary; they must also be situated where removal is practicable. With a view to safely Transplanting trees of a larger size than usual, a system of preparation one year in advance is advisable, particularly if the specimens are valuable. This consists in cutting a trench round the stem, at a distance which depends on the size of the ball which it is intended to move, and severing with a knife the large roots that reach thus far, making a clean cut. Previous to digging the trench, some new soil, of a light rather than heavy nature, should be prepared and brought alongside ready for use. Without allowing the roots to be long exposed, the trench should be filled up again with the fresh compost. In this, new feeders will usually push, during the following season, from the points which have been mutilated; and when the time for removing the tree arrives, the next trench requisite should be cut outside the one already referred to, and the young roots carefully preserved. Of course, cutting off the roots will effect a check on the vegetation and growth above ground. When there is a danger of the check being too great, the preparation is sometimes extended over two years, and only a half cut at one time. When this is practised, the circumference of the intended circular trench should be divided into about four equal parts, and two of these, opposite each other, dug out; the other two, which will also be opposite, may be left for treating similarly the next season. The principles which have been detailed in treating of the Transplanting of trees and plants of moderate size are similarly applicable, but on a larger scale, to those of unusual dimensions. If a ball of earth to be removed measures 2ft., 4ft., or 6ft. through, then the hole must be prepared so as to allow plenty of additional space for the roots to be spread out their full length. In starting to lift, it is best to begin wide, and allow sufficient room to work: the roots may be all the more readily separated from the soil and preserved from mutilation.

For Transplanting trees with a great weight of soil attached to their roots, different machines or tree-lifters are in use; the management of these invariably requires the closest attention on the part of every workman who assists, as well as the person in charge. Hence, this work, when mechanical power is necessary, should be executed only by those who understand the business from practical experience. Two of the best tree-lifting or Transplanting machines are those known respectively as Mr. McNab's and Mr. Barron's. The diameter of the ball is limited with Mr. McNab's to that of the inner part of the machine,

Transplanting—*continued.*

which travels on two high wheels and is provided with handles for guiding it. There are double rollers before and behind; those furthest from the handles lift out, and allow of the machine being placed in position for lifting with the tree in the centre. The ball is reduced to the proper size, and bound round with a piece of strong canvas and cords; then two strong boards, which belong to the machine, are placed just underneath at the bottom, and ropes are passed under their ends at right angles, and brought up to the rollers of the machine. When everything is ready, the plant is wound up sufficiently high for travelling by means of four cross-shaped, iron levers or handles, which fit, at the point of intersection, on the ends of two of the rollers. One of the disadvantages in the use of this machine is the liability of the soil to fall out from the bottom of the ball, but this largely depends on the kind of soil and its tenacity, and also on the amount of roots which the plant possesses. The boards are also sometimes liable to shift from their proper places beneath, and allow the plant to fall through; but this is not a very frequent occurrence. These are but some of the risks that must be encountered if Transplanting machines are used; they only happen occasionally if the balls are firm, and everything is properly adjusted.

FIG. 88. BARRON'S TRANSPLANTING MACHINE

Transplanting—*continued.*

Mr. Barron's Transplanting machine (see Fig. 88) is capable of moving very large trees and masses of earth; it is, as may be imagined, very strongly constructed, and travels with the tree in an upright position. The weight is borne by two very strong rollers, whose ends rest on beams about 20ft. in length, that pass from the front to the back part of the machine, one on each side. There are four wheels, which stand rather high, to allow of the ball of earth being suspended beneath the beams, but above the ground line, for travelling. Two strong planks are placed through beneath the ball, as near as can be under the centre, to which are attached the lifting ropes or chains, and cross planks are also placed above these, to make sure of bringing the mass up together. When all is in readiness, the rollers are very gently turned by means of straight, steel, lever bars, and a snatch catches in cogs on each roller, and prevents it from running back. Whether ropes or chains are used for lifting, they must be of great strength, as a serious accident might be the result at any minute were anything to break. If the ground over which the wheels are to pass, when loaded with a tree, is not very firm, it is necessary to use planks 3in. thick for forming a roadway. When the tree reaches its destination, it has to be brought over the hole, which should by that time be in readiness, and lowered into position by having the process of lifting reversed. This requires, if anything, even greater care than lifting, as there is more danger of a great weight overcoming the workmen when they are lowering than when they are raising it.

The whole details of working any Transplanting machine are beyond what can be properly described on paper so as to be understood; the operation can only be learnt from persons who understand the matter and have a machine before them, and by practical experience. The latter is in this case, as in most others, the best teacher; and it becomes necessary that anyone who undertakes the removal of large trees should have had such experience, not only for performing the work successfully, but also because the operation is one which, if improperly executed, endangers the lives of workmen employed, apart from accidents to which they may be subjected in the event of any unavoidable mishap.

TRAPA (abridged from *calcitrapa*, the Latin name of an instrument called Caltrops, furnished with four spines, formerly used in war to impede the progress of cavalry). Water Caltrops. ORD. *Onagrarieæ*. A small genus (about three species) of curious, stove or hardy, floating herbs, inhabiting Central and Southern Europe,

Trapa—*continued.*

and tropical and sub-tropical Asia and Africa. Flowers axillary, solitary, peduncled; calyx tube short, the limb four-parted, two or all the segments persistent and becoming spinescent on the fruit; petals four, white, small; stamens four. Fruit bony, one-celled, large, obovoid, with four angles, indehiscent, with a short, cylindric beak at the top. Leaves dimorphic; submerged ones opposite, root-like, pinnatipartite, with filiform segments; floating ones rosulate, rhomboidal, the petioles having a spongy dilatation near the apex. The large seeds of *T. bispinosa* are sweet and edible; in Cashmere, and other parts of the East, they are common food, and are known under the name of Singhara Nuts. The species require a rich, loamy soil, and to be grown in a cistern, or a large pot or tub of water. Propagation may be effected by seeds.

T. bispinosa (two-spined). Singhara Nut-plant. *fr.* ¾in. long and broad, glabrous or hairy; two opposite angles each with an often retrorsely scabrous spine, the other two angles sometimes obsolete. *l.*, floating ones 2in. by 2¼in. to 3in., very villous beneath, the posterior margin entire, the anterior lightly crenate; petioles 4in. to 6in. long, woolly. India and Ceylon, 1822. Stove. Doubtfully distinct from *T. natans*.

FIG. 89. UPPER PORTION OF PLANT OF TRAPA NATANS, showing Rosette of Floating Leaves.

T. natans (swimming).* Jesuit's Nut; Ling; Water Caltrops; Water Chestnut. *fr.* ¾in. broad, the four angles all spinescent, but the two lateral spines shorter. *l.*, floating ones 1in. long, toothed or incised-toothed on the anterior margin, sparingly villous on the nerves beneath; petioles 2in. to 4in. long,

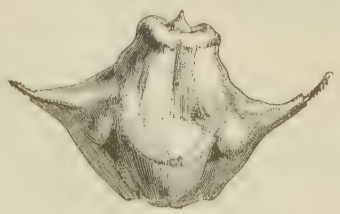

FIG. 90. FRUIT OF TRAPA NATANS.

glabrescent. Persia to Europe and the Upper Nile, 1781. Hardy. See Figs. 89 and 90. (B. R. 259; G. C. n. s., x., p. 212.)

T. verbanensis (Lago Maggiore).* *fr.* trigonous, compressed, with two short horns. *l.* deltoid, the two upper sides dentate, with bimucronulate teeth. Lago Maggiore, 1886. Hardy. Whole plant glabrous.

TRAPEZIFORM, TRAPEZOID. Scarcely differing from rhomboid; having four sides, the opposite ones not parallel.

TRAPS. It is advisable to be provided with some of these in gardens, for the destruction of various kinds of vermin. The chief kinds of Traps required are those used for catching rats, mice, and moles. Rats may be caught by the ordinary kind of Trap used by keepers for rabbits, &c., if placed in their runs; but these destructive animals are more quickly disposed of by poisoning, if it can be safely practised, and sometimes by the aid of a gun. Mice are often destructive in seed-rooms and seed-beds, when the seed is of a kind which they like. An ordinary brick, and what is known as a Figure of 4 Trap, baited with a small piece of cheese, will generally catch them with certainty; also the small box Mousetraps commonly used in houses. For moles, the iron Traps with a spring and double claws, which clip the animal, from whichever side it proceeds, round the body, have generally superseded, and are preferable in gardens to, the old kinds made of wood and small wire. Traps, as they are generally called, may be formed in various ways for particular purposes—as, for instance, to catch earwigs, which destroy the flower-buds of Chrysanthemums, Dahlias, &c. The best plan for trapping these is to put some dry material, such as hay or old beanstalks, into small flower-pots, and invert them on top of the stakes used for supporting the plants; or they may be placed amongst the branches. The earwigs conceal themselves in the pots, and, if these are examined occasionally, the insects may be shaken out and destroyed. A few small lettuce or tender cabbage leaves, also form, at times, an effectual Trap for slugs when these attack seedlings. Instead of retreating to their usual hiding-places, they will often shelter themselves under leaves purposely laid, and may easily be looked for and destroyed each morning. Cockroaches and beetles may be caught in large quantities by setting Traps in their haunts in the shape of open saucers or wide-necked bottles, partially filled with treacle, or any sweetened liquid. The Traps should be set so that the insects may enter them, but not get out again. Bottles partially filled with sweetened beer, or treacle, and suspended in vineries, often prove excellent Traps for catching large flies and wasps, which attack and eat the grapes.

TRATTENIKIA. A synonym of **Marshallia** (which *see*).

TRAUTVETTERIA (named in honour of Prof. Ernest Rud. Trautvetter, a Russian botanist of this century). ORD. *Ranunculaceæ*. A monotypic genus. The species is a hardy perennial, thriving in ordinary soil. It may be propagated by divisions.

T. palmata (palmately-lobed). False Bugbane. *fl.* white, small, corymbose-paniculate; sepals three to five, usually four, concave, petal-like, very caducous; petals none. July and August. *l.* palmately lobed; radical ones large, the lobes toothed and cut; cauline ones few, alternate. Stems 2ft. to 3ft. high. North America and Japan. (B. M. 1630, under name of *Cimicifuga palmata*.) SYN. *Actæa palmata*.

TRAVELLERS' JOY. A common name for **Clematis Vitalba** (which *see*).

TRAVELLERS'-TREE. A popular name for **Ravenala madagascariensis** (which *see*).

TREASURE FLOWER. A common name for **Gazania** (which *see*).

TRECULIA (named in honour of M. Auguste Trécul, of Paris, author of a monograph on *Nuphar lutea*, in 1843). ORD. *Urticaceæ*. A small genus (two or three species) of stove, glabrous trees or shrubs, natives of tropical Africa. Flowers dicœcious; heads sessile or shortly pedunculate, at the axils or the defoliated nodes; bracts under the head few, small, somewhat biseriate, but by no means forming a true involucre. Leaves alternate, shortly petiolate, entire, coriaceous, penniveined; stipules lanceolate, rather small, caducous. *T. africana*, the only species introduced, is an evergreen tree. It requires a compost of rich loam and leaf mould, and a moist atmosphere. Propagation may be effected by cuttings of the ripened shoots, inserted in sandy loam, under a bell glass, with bottom heat.

T. africana (African). African Bread-fruit Tree; Okwa-tree. *fl.* green, in globose, shortly pedunculate heads. September. *fr.* in a head 1ft. or more in diameter. *l.* alternate, very shortly petiolate, thickly coriaceous, 6in. to 14in. long, sometimes 7in. to 8in. broad, oblong-ovate or lanceolate, abruptly and obtusely acuminate, acute or oftener cordate at base; stipules 1in. long, caducous. *h.* 60ft. to 80ft. 1872. (B. M. 5986.)

TREE. Any woody plant of perennial duration which rises from the ground with a distinct trunk.

TREE FERN. A common name for Ferns with an arborescent caudex: *e.g.*, species of *Alsophila*, *Cyathea*, and *Dicksonia*.

TREE-GUARDS. These, in some form, are requisite for placing round all newly-planted trees in public streets, avenues, &c., where it is often necessary to provide some protection for the stem for several years. Besides protecting trees, the Guards act as an efficient support against injury from the wind after transplanting. The most substantial and best-formed, though rather expensive, Tree-guards, are those of circular shape, made of iron, the lower part, which is fixed into the ground, being wider in diameter than that which surrounds the tree stem higher up. A common form of Tree-guard consists of three upright wooden posts, placed in a triangular shape, and fixed with pieces of wood at an equal distance from each other at the top. The kind of Guard which causes least injury to the roots is, of course, preferable; the tree should always be tied at the top with cord, so that it cannot possibly come in contact with any part of the Guard and be injured. For protecting the bark of trees planted in streets from being cut by mischievous individuals, ordinary wire netting, of fine mesh, may be tied round the stems when the trees are first planted.

TREE MALLOW. *See* **Lavatera arborea.**

TREE MIGNONETTE. A title given to plants of Mignonette when grown singly to flower in large pots on tall stems as single specimens. Mignonette plants grown in tree form are interesting and ornamental subjects for conservatory decoration; but for general usefulness, five or six plants grown in each pot as dwarf specimens are most desirable. *See* **Mignonette.**

TREE OF CHASTITY. *See* **Vitex Agnuscastus.**

TREE OF HEAVEN. *See* **Ailantus.**

TREE OF LIFE. A common name for **Thuya** (which *see*).

TREE OF SADNESS. *See* **Nyctanthes Arbor-tristis.**

TREE PANAX. *See* **Dendropanax.**

TREE SLUG. *See* **Slugs.**

TREFOIL. *See* **Trifolium.**

TREFOIL, BIRD'S-FOOT. *See* **Lotus corniculatus.**

TREFOIL, GOLDEN. An old name for **Anemone Hepatica** (which *see*).

TREFOIL, MILK. An old name for the genus **Cytisus** (which *see*).

TREFOIL, MOON. A common name for **Medicago arborea** (which *see*).

TREFOIL, SCENTED. A common name for **Melilotus** (which *see*).

TREFOIL, SHRUBBY. A popular name for **Jasminum fruticans** and **Ptelea trifoliata** (which *see*).

TREISIA. Included under *Euphorbia*.

TRELLIS. A framework fixed in glass houses near the roof, on which to train plants and trees, such as Vines, Peaches and Nectarines, Cucumbers, and Melons, none of which could receive proper attention unless so treated. A Trellis may also be formed to fix into a large pot for the accommodation of an individual plant, as, for example, a Stephanotis or Bougainvillea grown for exhibition. Galvanised wire of different sizes is generally used, according to the different purposes for which it is intended. In Vineries and Peach-houses, the Trellis should be fixed, not less than 1ft. from the glass, as it is always required; in Cucumber and Melon-houses, it may be in pieces, so as to be removed when the house is used for growing other plants which do not require a Trellis. The wires for training Vines upon should be fixed horizontally, 9in. apart; and for Peaches and Nectarines 6in. is preferable. When a Trellis is made in movable sections, the wires are usually crossed, to form a diamond-shaped pattern, and this allows of plants being tied and trained in any direction. Pyramid and balloon-shaped Trellises are those usually selected for specimen pot-plants.

TREMANDRA (from *tremo*, to tremble, and *anthos*, a male; the anthers vibrate with the least movement of the air). ORD. *Tremandreæ*. A genus comprising only a couple of small, greenhouse, more or less stellate-tomentose, Australian shrubs. Flowers five-parted; stamens apparently in a single series; disk crenate, almost five-lobed. Leaves opposite, toothed. For culture of the only species introduced, *see* **Tetratheca** (to which it is closely allied).

T. stelligera (star-bearing). *fl.* on pedicels shorter than the leaves; sepals tomentose or villous, two to three lines long; petals but little longer; anthers dark purple. Summer. *l.* opposite, shortly petiolate, ovate, obtuse, 1in. to 1½in. long, coarsely and irregularly toothed or rarely entire. *h.* 2ft. or more. Plant densely stellate-hairy.

T. verticillata (whorled). A synonym of *Platytheca galioides*.

TREMANDREÆ. A small natural order of usually Heath-like, glabrous or glandular-hairy, extra-tropical Australian shrubs. Flowers usually red or purple, regular, solitary, on axillary pedicels; sepals four or five, very rarely three, free, valvate in bud; petals as many, hypogynous, spreading, induplicate-valvate in bud; stamens twice as many, hypogynous, free; filaments short; anthers two or four-celled, opening in a single, terminal pore; torus small, or rarely expanded into a disk between the petals and stamens. Capsule usually flattened, two-celled, opening loculicidally at the edges. Leaves small, alternate, opposite, or whorled, rarely larger and stellate-tomentose. The order contains three genera—*Platytheca*, *Tetratheca*, and *Tremandra*—and about twenty-one species.

TREMANTHUS. A synonym of **Styrax** (which *see*).

TREMEX. A genus of Sawflies, so closely related to **Sirex** (which *see*), and so similar in general appearance and habits, as to render a detailed account of the species unnecessary. This genus has not been met with in Great Britain; but one species (*T. Columba*), popularly known as the Pigeon Tremex, is destructive

Tremex—*continued.*

to the wood of Pear-trees, and also to Elms and Maples, in Canada and the United States, and may not improbably be introduced into Britain in trees from those countries. The female has the body about 1½in. long, with the ovipositor extending nearly ½in. backwards. The wings have a spread of about 2½in.; they are smoky-brown. The head and thorax are reddish-brown, with black markings; and the abdomen is black, with seven yellow cross-bars, each, except the first two, broken in the middle. The male is little more than half as large as the female, and the markings are less conspicuous, the body being reddish, varied with black, and the wings more transparent.

Should this insect be accidentally imported, the measures to be employed against it are the same as those recommended under **Sirex.**

TRENCHING. A term applied to the process of digging ground for the special purpose of increasing its depth for the better cultivation of various crops. It is chiefly practised in autumn, and the surface thrown up roughly for exposure to the weather. In commencing to trench a piece of ground, the soil, for about the width of 3ft., should be dug out a spit or more deep along one end, and wheeled to the opposite end, where it is intended to finish. The depth which should be taken out varies according to the nature of the subsoil; if this is unfit to bring to the surface, it should be dug and still left beneath. Another width should then be marked out, and the top spit of soil turned over to take the place of that wheeled away, the bottom being, in its turn, treated like the first; and so on. When the soil is good enough to allow of the bottom spit being brought to take the place of the top, the first trench must be taken out to the full depth, and the bottom broken up. Trenching invariably deepens and improves garden land, but it is not always advisable to bring up the bottom soil at first; this is sometimes of a nature which causes actual harm to crops, and had better be left at the bottom below the limit which the roots reach. Trenching must, therefore, be practised with judgment. The bottom soil may always be loosened and dug, with advantage to that on the surface; and if some loose leaf mould or light manure is mixed into that beneath during the process, it will, in course of time, improve the whole bulk, and render it of a better description than before to a much greater depth.

Trenching—*continued.*

FIG. 91. TREVESIA EMINENS.

TRENTEPOHLIA. Included under *Cyperus.*

TREVESIA (called after the family Treves de Bonfigli at Padua, who were supporters of botanical research). ORD. *Araliaceæ.* A genus embracing eight or nine species of prickly or unarmed, stove shrubs or small trees, inhabiting tropical Asia, Malaya, and the Pacific Islands. Flowers polygamous, in panicled umbels; petals eight to twelve, often cohering as a cap in the fertile flowers; stamens as many as the petals; pedicels not jointed; bracts small or wanting. Leaves ample, palmatifid, or digitately or pinnately compound. *T. eminens* and *T. palmata* require a mixture of sand, loam, and leaf mould. Cuttings will readily root in sand, under a glass, in heat.

T. eminens (eminent). *l.* long-stalked, roundish in outline, palmatifidly divided about two-thirds of their depth into nine lanceolate segments, which have each a prominent rib and both edges serrated, the teeth distinct, small, but sharp-pointed. Philippines, 1882. Probably a mere form of *T. palmata.* See Fig. 91 (for which we are indebted to Mr. Wm. Bull).

T. palmata (palmate-leaved). *fl.* greenish-white; panicles 1½ft. long, straggling, clothed, when young, with red-brown tomentum. March. *l.* very large, sometimes 2ft. long, palmate or digitate, nearly glabrous; segments lobed or sub-pinnatifid. Shoots covered with reddish hair and many prickles. *h.* 10ft. to 15ft. India, 1818. Tree. SYNS. *T. sundaica, Gastonia palmata* (B. R. 894).

T. sundaica (Sunda Isles). A synonym of *T. palmata.*

TREVIRANA. A synonym of **Achimenes** (which *see*).

TREVOA (named in honour of Trevo, a Spanish botanist). ORD. *Rhamneæ.* A small genus (two or three species) of much-branched, greenhouse trees, natives of South America. Flowers fascicled below axillary spines; calyx four or five-lobed; petals four or five, hooded; stamens four or five, the filaments pilose; pedicels short, one-flowered. Leaves opposite, ovate or obovate, three-nerved, serrulated. *T. trinervis* has been introduced, but is now probably lost to cultivation.

TREWIA (named in honour of C. J. Trew, 1695-1769, of Nuremberg, a botanical author). SYN. *Rottlera* (of Willdenow). ORD. *Euphorbiaceæ.* A genus consisting of only two species of stove trees, often branched from the base, with soft wood, natives of the East Indies. Flowers dicœcious, apetalous; disk none; male racemes lateral, opening before the leaves, long and loose, the flowers rather large, solitary, pedicellate, with a bract; female flowers solitary on an axillary peduncle or indefinitely racemose. Leaves opposite, petiolate, broad, entire, three to five-nerved. *T. nudiflora,* the only species introduced, succeeds in a compost of sandy loam and peat; it may be readily increased by cuttings, inserted in sand, under a glass, in heat.

T. nudiflora (naked-flowered). *fl.*, racemes axillary; males often exceeding the leaves, bearing flowers along nearly the whole of their length; females few-flowered. May. *l.* broadly ovate, acute or acuminate, cordate, obtuse or contracted-sub-cuneate at base, five-nerved, entire. Branchlets glabrous, or the young ones pubescent. *h.* 5ft. and upwards. East Indies, 1796. (B. F. S. 281.)

TRI. This term, used in compounds, signifies three: *e.g.*, Tricuspidate, three-cusped.

TRIACHYRUM. A synonym of **Sporobolus** (which *see*).

TRIADELPHOUS. When the stamens of a flower are disposed in three bundles.

TRIADICA. A synonym of **Sapium** (which *see*).

TRIANDROUS. Having three stamens.

TRIANEA (named in honour of M. José Triana, a botanist and traveller in Columbia). SYNS. *Hydromystria, Jalambicea.* ORD. *Hydrocharideæ.* A genus comprising three or four species of stove or greenhouse, stoloniferous, aquatic herbs, natives of North America, Mexico, and tropical South America, now regarded, by Bentham and Hooker, as synonymous with *Limnobium.* Spathes unisexual, two-leaved in both sexes; male flowers two or three in a spathe, long-pedunculate; females solitary in a spathe, sessile or shortly petiolate. Leaves fascicled at the nodes, petiolate, the blades swimming on the top of the water, ovate or rounded-cordate, sometimes (not always) of a thick, spongy substance below. Stems stoloniferous. *T. bogotensis,* the only species yet introduced, thrives in stove or greenhouse heat. Propagation is readily effected by runners.

Trianea—*continued.*

T. bogotensis (Bogota). *fl.* small, six-parted; bracts hyaline, embracing the peduncles. *l.* clustered, oblong or orbicular, flat-convex, below spongy-reticulated; petioles dilated at base. Columbia, 1879. The correct name of this plant is *Limnobium bogotense.* (G. C. n. s., xv., pp. 466-468; R. G. 980.)

TRIANTHEMA (from *treis,* three, and *anthos,* a flower; alluding to a frequent disposition of the blossoms). ORD. *Ficoideæ.* A genus embracing about a dozen species of stove or greenhouse, diffuse, prostrate herbs, rarely sub-shrubs, inhabiting the warm regions of Asia, Africa, and Australia, and the West Indies. Flowers axillary, solitary, cymose or fascicled, sessile or pedunculate, rarely sub-spicate on the terminal branches; calyx lobes five; petals absent; stamens five or indefinite. Leaves opposite, unequal, petiolate, obovate, ovate, or linear, entire. Three species have been introduced, but they are interesting only to the botanist.

TRIAS (from *treis,* three; alluding to the arrangement of the floral envelopes). ORD. *Orchideæ.* This small genus embraces only three species of dwarf, tufted or creeping, stove Orchids; two are natives of Moulmein, and the other inhabits the East Indian peninsula. Sepals sub-equal, spreading, the lateral ones adnate at base with the foot of the column; petals small, oblong or linear; lip slightly spreading at apex, narrow, rather thick; scapes lateral, slender, leafless, one-flowered. Pseudo-bulbs rather small, sub-globose, one-leaved at apex. *T. oblonga,* probably the only species in cultivation, thrives best in an intermediate house, in small pans of peat and sphagnum, or on blocks with a little peat and sphagnum fastened amongst the roots.

T. oblonga (oblong-leaved). *fl.* fuscous-green, with a purplish lip; scapes erect, much shorter than the leaves. April. *l.* small, oblong, acute, coriaceous. *h.* 3in. Moulmein, 1837.

FIG. 92. FLOWERING BRANCH OF TRIBULUS TERRESTRIS

TRIBLEMMA. Included under *Asplenium.*

TRIBRACHIUM. A synonym of **Bulbophyllum** (which *see*).

TRIBULUS (*Tribolos* was the old Greek name used by Theophrastus, from *treis*, three, and *bolos*, a point; each carpel is often armed with three or four large spines). Caltrops. ORD. *Zygophylleæ.* A genus comprising about fifteen species of loosely-branched, stove, greenhouse, or hardy herbs, dispersed over the warmer regions of the globe. Flowers white or yellow, solitary, pseudo-axillary, pedunculate. Leaves stipulate, opposite, or by abortion alternate. Most of these plants, several of which have been introduced, are weedy-looking subjects, and interesting only to a botanist. *T. terrestris*, a South European plant, is shown at Fig. 92.

TRICERAIA. A synonym of **Turpinia** (which *see*).

TRICHÆTA. Included under **Trisetum** (which *see*).

TRICHANTHA (from *thrix*, *trichos*, a hair, and *anthos*, a blossom; alluding to the slender pedicels). ORD. *Gesneraceæ.* A genus of two species of stove, creeping or climbing shrubs, natives of Columbia. Flowers solitary or fascicled in the axils, pedicellate, ebracteate; calyx free, coloured, ciliated-plumose, five-parted; corolla dingy violet, the limb and tube striped or angled with five longitudinal, yellow marks; limb loosely oblique, of five short, equal lobes. Leaves opposite, very different, one being ovate or oblong and acuminate, and the other dwarf. *T. minor*, the only species known in gardens, thrives in well-drained pots of peat, leaf mould, and sand, and is readily increased by means of cuttings, inserted in pots of sandy soil, and plunged in bottom heat.

T. minor (lesser). *fl.*, corolla 2in. long, tubular, sub-ventricose, crinite-hairy, constricted above the base; limb obliquely four-lobed, the upper lobe bifid, with a club-shaped appendage; peduncles one-flowered. *l.*, the large one shortly petiolate, ovate, acuminate, entire, hairy beneath, slightly succulent. Stem climbing, radicant, adpressedly pilose or glabrous. 1864. (B. M. 5428; G. C. 1864, p. 172.)

TRICHARIS. A synonym of **Dipcadi** (which *see*).

TRICHILIA (from *tricha*, by threes; the ovary and capsule are usually trilocular). ORD. *Meliaceæ.* A genus comprising about thirty species of stove trees and shrubs, natives of tropical Africa and America. Flowers rather large for the order, disposed in axillary, many-flowered panicles; calyx four or five-toothed or cleft; petals four or five, imbricated; staminal tube eight to ten-cleft or parted, rarely entire. Leaves trifoliolate or imparipinnate; leaflets opposite or alternate, often many-jugate, very rarely bijugate. A selection of the introduced species is here given. They are not much grown, and rarely flower in this country. A compost of loam and peat is most suitable. Propagation may be effected by cuttings of the ripened wood, with the leaves intact, inserted in sand, under a glass, in heat.

T. glabra (smooth). A synonym of *T. havanensis.*

T. havanensis (Havana). *fl.* white, long-pedicellate, densely crowded in very short, umbelluliform panicles. June. *l.* shortly petiolate, three-jugate; leaflets sessile, opposite, obovate, cuneate at base, rounded or obtuse, sometimes slightly acuminate, at apex, firm, opaque, somewhat shining. *h.* 20ft. Havana, 1791. Shrub or tree. SYN. *T. glabra.*

T. hirta (hairy). Bastard Ironwood. *fl.* whitish; panicles puberulous, two to four times exceeded by the leaves. June. *l.*, leaflets five-jugal, variable, elliptic or oblong-lanceolate, tapering to the base, glabrous, the lower ones smaller. *h.* 12ft. West Indies, 1800. Tree.

T. odorata (fragrant) *fl.* yellowish, sweet-scented; pedicels much longer than the flowers; cymes glabrous, many-flowered. June. *l.*, leaflets five-jugal, elliptic or oblong, 2in. to 6in. long; petioles naked. *h.* 12ft. to 25ft. West Indies, 1801. A low tree or shrub. (A. B. R. 637; H. E. F. 128.)

T. spondioides (Spondias-like). White Butterwood. *fl.* of a greenish-yellow colour; panicles puberulous, one-fourth the

Trichilia—*continued.*

length of the leaves, the divisions three to eleven-flowered. June. *l.*, leaflets seven to ten-jugal, ovate-oblong, oblique at base, acute at apex, glabrous, the lower ones smaller. *h.* 15ft. to 20ft. Tropical America, 1870. Tree. (Ref. B. 293.)

TRICHINIUM (from *trichinos*, covered with hairs; alluding to the shaggy appearance of the blossoms). ORD. *Amarantaceæ.* A genus comprising about fifty species of greenhouse herbs, under-shrubs, or rarely small shrubs, limited to Australia. Flowers in dense, globular, ovoid, or cylindrical spikes, very rarely elongated and interrupted; perianth usually pink or straw-colour, with a short, hard tube and five hairy segments; stamens five, but usually one, two, or three, without anthers. Leaves alternate, narrow or rarely obovate. Only three species have been introduced. They are all perennials, and thrive under cool greenhouse treatment, in any rich soil. Loam, rotten manure, and sand, make a suitable compost. The plants do best on an airy shelf, in full sunlight, and should be watered freely during the growing season. After flowering, water should be almost entirely withheld. Propagation is readily effected by means of the thick roots, which should be cut into pieces about 1in. long, and inserted in sand, in bottom heat.

T. alopecuroideum (Fox-tail Grass-like). A synonym of *T. exaltatum.*

T. exaltatum (exalted). *fl.*, perianth about ⅜in. in diameter, the segments yellow, with dull red tips; spikes erect, on long peduncles, at length oblong-cylindrical, about 2½in. in diameter. June. *l.*, radical and lower ones oblong-lanceolate, 3in. to 5in. long, contracted into long petioles; upper ones small, sessile. *h.* 2ft. to 3ft. 1838. A stout plant. (B. R. 1839, 28, under name of *T. alopecuroideum.*)

T. Manglesii (Mangles').* *fl.*, perianth ⅜in. to 1in. long, the segments with pink or whitish tips; spikes globular or ovoid, about 2in. in diameter, the coloured tips of the perianth protruding from the long, white hairs. June. *l.*, radical ones long-petiolate, varying from ovate to linear, obtuse or acute, 1in. to 3in. long; cauline ones few, narrow, very acute. Stems decumbent, ascending, or rarely erect, 6in. to 12in. long. 1838. (B. M. 5448; F. d. S. 2396; G. C. 1864, p. 555; I. H. 464; R. H. 1866, p. 291.)

T. Stirlingii (Stirling's). *fl.*, perianth scarcely ⅛in. long, the segments plumose, with pink tips; spikes globular, solitary at the ends of the stems or loosely paniculate, ⅜in. to 1in. in diameter. June. *l.* lanceolate, oblong, or almost linear; lower ones obtuse, shortly petiolate; upper ones small, more acute, sessile. Stems long, procumbent or ascending, and (as well as the leaves) clothed with white hairs. 1838.

TRICHOCARPA. Included under **Deparia** (which *see*).

TRICHOCAULON (from *thrix*, *trichos*, a hair, and *caulon*, a stem; alluding to the bristles that tip each tubercle). ORD. *Asclepiadeæ.* A small genus (two species) of dwarf-growing succulents, natives of South Africa. Flowers small, proceeding from the angles near the upper part of the stem, sub-solitary; calyx five-partite, the segments acuminate; corolla deeply five-lobed; outer corona deeply bilobed. Leaves none. Stems dwarf, stout, fleshy, many-angled; angles tuberculate; tubercles tipped with a bristle. For culture, *see* **Stapelia.**

T. piliferum (bristle-bearing). *fl.* ⅛in. to ⅜in. in diameter, sessile in the furrows of the stem; corolla between funnel and bell-shape, pale yellow-red without, dark purple within. Branches tufted, straight, cylindric, simple, erect, proceeding from a short, stout rootstock. 1882. (B. M. 6759.) SYNS. *Piaranthus piliferus*, *Stapelia pilifera.*

TRICHOCENTRUM (from *thrix*, *trichos*, a hair, and *kentron*, a spur; alluding to the long, thin spur of the labellum). ORD. *Orchideæ.* A genus including about fourteen species of stove, epiphytal Orchids, natives of tropical America. Flowers mediocre or rather large; sepals and petals sub-equal, free, spreading; lip at base connate with the column, forming a pitcher, produced into a descending spur, above the pitcher erect, biauriculate or naked; lateral lobes scarcely dilated, nearly erect; column short, thick; pollen masses two, ovoid; scapes short, many-sheathed, one or rarely two-flowered. Leaves coriaceous. Stems very short, one-leaved, at length thickened into a small, fleshy pseudo-bulb. The

Trichocentrum—*continued.*

species thrive best in an intermediate temperature, in a moist, shady position, attached to blocks of soft wood or pieces of tree-fern stem. Water must be given all the year round, but care must be taken to prevent the roots being in contact with stagnant moisture. Propagation may be effected by division.

T. albo-purpureum (white-and-purple).* *fl.* large, freely produced; sepals and petals bright cinnamon-brown outside, tawny-yellow inside; lip white, with two large, purple spots near the base, the disk veined with rosy-purple, passing to yellow, and having a crest of four rosy-purple keels. *l.* sessile, oblong, acute, shining green, 4in. to 6in. long. Brazil, 1866. (B. M. 5688; G. C. 1866, 219; W. O. A. 204.)

T. capistratum (haltered). *fl.* one to a peduncle; sepals and petals yellow; lip white, dotted and blotched with purple, remarkable for having its base extended into five short spurs. *l.* oblong-lanceolate, purplish. Costa Rica, 1871.

T. cornucopiæ (cornucopia). A small plant, with yellowish-white flowers, having more botanical than horticultural interest. Rio Negro (?), 1866. (Ref. B. 77; R. X. O. 177.)

T. fuscum (fuscous). *fl.* on short peduncles; sepals and petals purplish-green, spreading; lip much longer than the petals, cuneate, waved, with a slender spur at base, two-lobed at apex, lower down blotched with rose-colour and spotted with red. *l.* oblong, acute, spreading, somewhat twisted, purplish-green, minutely dotted. Mexico, 1841. (B. M. 3969; B. R. 1951.)

T. f. Krameri (Kramer's). A large-flowered variety, with a longer and thinner spur than in the type. Brazil, 1885.

T. Hoegii (Hoege's). *fl.* very large, borne on a zigzag peduncle; sepals and petals greenish-yellow, with a purple middle area; lip white, with brilliant purple lines and blotches, and two blunt, yellow calli at the base, pandurate, undulated, notched at the tip; spur with a clavate, notched apex. *l.* robust, horny, cuneate-oblong, acute. Mexico, 1882. A small but distinct plant.

T. ionophthalmum (violet-eyed). *fl.*, upper sepal and petals very light yellowish-maroon-brown, with brown dots at top, unguiculate, blunt; lateral sepals wholly brown; lip whitish, with a large, violet blotch on each basilar angle, pandurate. *l.* broader and shorter than those of *T. albo-purpureum* (which this plant resembles). Amazons, 1876.

T. maculatum (spotted). *fl.* large; petals white, spotted with purple, oblong, obtuse; lip with a yellow crest, obovate, bilobed, very obtuse; spur very long. February. *l.* very thick, fleshy, linear-oblong, obtuse, spotted with red. Sierra Nevada, 1844.

T. orthoplectron (straight-spurred).* *fl.* large; sepals and petals light cinnamon-brown, tipped with yellow, cuneate-oblong; lip white, with a crimson-lake blotch on each side of the base, and five bars or semi-abortive keels of the same colour between the blotches, the disk in front of the crest being yellow; spur tapering to an acute point. October. Brazil. A curious and beautiful epiphyte. (W. O. A. 272.)

T. Pfavii (Pfau's).* *fl.* in pairs on a raceme, as large as those of *Oncidium Gardneri*; sepals and petals half brown, half white, spathulate, obtuse; lip white, with a red blotch in the middle of its stalk, cuneate-flabellate, bilobed, crisped. Central America, 1881. (G. C. n. s., xvii. 117; I. H. ser. iii. 587; R. G. 1103.)

T. P. zonale (zonal). *fl.*, sepals and petals entirely brown at their base, or the brown broken up into blotches, obtuse or acute; lip having one large, purple blotch or two darker ones before its base. 1883. An interesting and variable form.

T. porphyrio (porphyry-like). *fl.* solitary, about 2in. in diameter; sepals and petals brown, unequally margined and tipped with yellow, cuneate-oblong, acute; lip rich magenta-purple, faintly margined with white towards the point and having a rectangular, sulphur-yellow blotch on the disk in front of the three purple lines of the crest. *l.* cuneate-oblong. South America, 1884. A very handsome species. (I. H. ser. iii. 508.)

T. pulchrum (pretty). *fl.* yellow and white; sepals much spreading, oval-elliptic; lip erect, obovate, cuneate at base, emarginate at apex. July. *l.* two or three, thickened at base, oblong, obtuse or acute, sometimes mucronate. Peru.

T. purpureum (purple). *fl.*, sepals and petals of a dull olive-green; lip purple, obovate-oblong, emarginate; spur thick, curved; scapes small, radical, one or two-flowered. Demerara.

T. tenuiflorum (slender-flowered). *fl.* dingy brown and white, small; sepals and petals narrow, the former acute, the latter obtuse; lip linear-obovate, with a pair of plates occupying the whole of the base. Bahia.

T. tigrinum (tiger-striped).* *fl.* one or two to a peduncle; sepals and petals greenish-yellow, transversely barred and distinctly spotted with purplish-brown; lip pure white, 1½in. long, nearly 2in. across the dilated apex, with a yellow crest on the disk, and on each side at the base a wedge-shaped blotch of purple. *l.* oblong, more or less dotted with deep red. Ecuador, 1869. A remarkably handsome and desirable species, producing its blossoms while in a very small state. (I. H. ser. iii. 282.)

T. t. splendens (splendid). A fine variety, having the base of the large, obcordate lip of a rich purple colour. 1886.

TRICHOCEPHALUS. Included under **Phylica** (which *see*).

TRICHOCEROS (from *thrix, trichos*, a hair, and *keras*, a horn; alluding to the two hairy, antenna-like processes from the column). ORD. *Orchideæ*. A small genus (six or seven species, which may be reduced to three or four) of stove, epiphytal Orchids, natives of Peru and Columbia. Flowers loosely racemose at the apices of the peduncles, mediocre or small, rather long-pedicellate; sepals sub-equal, free, and spreading, larger than the petals; lip sessile at the base of the column, spreading; pollen masses four; bracts shorter than the pedicels. Leaves few, distichous, coriaceous or fleshy. *T. parviflorus*, the only species yet introduced, thrives in small pans or baskets of peat and sphagnum.

T. parviflorus (small-flowered). *fl.* green, marked with purple and brown spots and bars, small; lip three-parted, minutely ciliolate; peduncle slender, nearly terete, axillary. Pseudo-bulbs small, bearing a single, fleshy leaf. Columbia, 1870. (R. X. O. i. 9.)

TRICHODESMA (from *thrix, trichos*, a hair, and *desmos*, a bond; the anthers are bound to each other by hairs). SYNS. *Borraginoides, Friedrichsthalia, Leiocarya, Pollichia, Spiroconus, Streblanthera*. ORD. *Borragineæ*. A genus comprising nine or ten species of coarse, hardy or half-hardy herbs, inhabiting Africa, tropical and Central Asia, and Australia. Flowers in terminal racemes; calyx deeply five-cleft; corolla of five often long-acuminate lobes; stamens five; anthers connivent by means of hairs. Leaves opposite or alternate, entire. *T. zeylanicum*, the only species known to cultivation, is a coarse, hardy annual, thriving under ordinary treatment.

T. zeylanicum (Cingalese). Ceylon Borage. *fl.* pale blue, in simple racemes; calyx segments ¼in. to ½in. long; corolla lobes broad, longer than the calyx. *l.* linear to oblong-lanceolate, often 3in. to 4in. long, the margins usually recurved. *h.* several feet. Southern India, Ceylon, Mascarene Islands, and Australia. (B. M. 4820.)

TRICHODIUM. This genus is now included under *Agrostis*.

TRICHOGLOTTIS (from *thrix, trichos*, hair, and *glottis*, a tongue; alluding to the fine hairs on the labellum). ORD. *Orchideæ*. A small genus (four or five species) of inconspicuous, stove Orchids, mostly natives of the Malayan Archipelago. Flowers small or mediocre, one or a few on very short, lateral peduncles; sepals spreading, the lateral ones very broad, adnate to the foot of the column, the dorsal one and petals oblong; lateral lobes of lip short, erect, the middle one rather broad; column short, wingless. Leaves distichous, scattered at the sides of the stem, narrow. Stem leafy, elongated, not pseudo-bulbous. The species mentioned below thrive in small pans of peat and sphagnum, in the East India house, and require an abundant supply of moisture when growing.

T. cochlearis (spoon-like). *fl.* white, with purple bars on both sides of the sepals and petals, smaller than those of *Saccolabium violaceum*; spur conical; lip spoon-like, very thick, with a few purple blotches; inflorescence very short, zigzag, four-flowered. *l.* like those of *Sarcanthus rostratus*, but thicker, and with a quite unequal point on one side projecting much farther than the other one. *h.* 8in. Sumatra, 1883.

T. fasciata (banded).* *fl.*, sepals and petals cuneate-oblong, acute, the lateral sepals falcate; sepals closely cross-banded with pale chestnut-brown; lip whitish, with yellow tips to the side plates of the anterior part and a few purplish spots on the keel of the under side. *l.* distichous, oblong, bilobed. Eastern tropical Asia, 1872. (W. O. A. 208.)

TRICHOLÆNA. Included under *Panicum*.

TRICHOMANES (the old Greek name used by Theophrastus, from *thrix, trichos*, a hair, and *manos*, soft; alluding to the delicate nature of the fronds). Bristle Fern. Including *Feea, Hymenostachys, Involucraria, Lacostea, Lecanium, Microgonium, Phlebiophyllum*. ORD. *Filices*. A genus comprising about 100 species of mostly stove Ferns, inhabiting tropical and temperate climates. Fronds varying from simple to decompound-multifid,

Trichomanes—*continued.*

membranous and pellucid, smooth or bearing simple, forked, or stellate hairs. Sori marginal, always terminating a vein, more or less sunk in the frond; involucre monophyllous, tubular, closely corresponding with the frond in texture, the mouth truncate or winged, or slightly two-lipped; receptacle filiform, elongated, often considerably exserted beyond the mouth of the involucre, capsuliferous principally at the base; capsules sessile, depressed, surrounded by an entire, broad, nearly transverse ring, bursting vertically. The introduced species are here described; except where otherwise stated, they need stove heat. They should be "grown in square, shallow pans and boxes, well-drained in the ordinary way, and having about 2in. of peat soil mixed with nearly half its bulk of sand and small broken potsherds; but soft sandstone is best. For the creeping sorts, the soil should be raised in the form of a mound; and for those that have long-extending rhizomes, if soft stone cannot be had, it is desirable to invert a pan or common deep pot, covering it with a layer of soil, as already explained, to which the plant will cling, and soon form a green hillock. Junks of wood answer the purpose, but in a moist, close, and warm atmosphere, Fungi and insects breed, and in a short time the wood decays, causing unnecessary disturbance of the whole mass of the plant" (J. Smith). *See also* **Ferns.**

T. achilleæfolium (Achillea-fronded). A synonym of *T. rigidum.*

T. alatum (winged).* *sti.* tufted, 2in. to 4in. long, winged above. *fronds* 3in. to 12in. long, 1in. to 4in. broad, lanceolate or ovate-lanceolate, bi-tripinnatifid; main rachis winged throughout; pinnæ lanceolate, acute, cut more than half-way to the rachis; lobes again often sharply toothed. *sori* two to twelve to a pinna, terminal on the segments, the mouth spreading. West Indies, 1824. Very variable in robustness and hairiness. SYN. *T. attenuatum* (H. S. F. i. 39c). Greenhouse.

T. anceps (double). A synonym of *T. maximum.*

T. angustatum (narrowed). A synonym of *T. tenerum.*

T. apiifolium (Apium-fronded).* *sti.* tufted, 4in. to 6in. long, strong, erect, fibrillose, the tuft densely so at the crown. *fronds* 9in. to 18in. long, 4in. to 8in. broad, ovate, quadripinnatifid; main rachis only slightly winged towards the apex; lower pinnæ 4in. to 6in. long, 1in. to 1½in. broad, lanceolate, acuminate; pinnules with numerous segments, which are again cut down into ultimate divisions about one line long. *sori* two to twelve to a pinnule; involucre short, turbinate. Philippine Islands, &c. SYN. *T. meifolium.* Greenhouse.

T. attenuatum (attenuated). A synonym of *T. alatum.*

T. auriculatum (eared). *rhiz.* strong, wide-creeping, tomentose. *fronds* nearly sessile, 6in. to 12in. long, 1½in. to 2in. broad, bipinnatifid; rachis wiry, very slightly winged thoughout or above only; pinnæ short-stalked, ovate, rhomboidal, obliquely cuneate at base, irregularly pinnatifid half-way down or more, the lowest anterior lobes often considerably prolonged beyond the others. *sori* two to twelve to a pinna the mouth truncate. Japan, &c., 1871. SYN. *T. dissectum.*

FIG. 93. PORTION OF FERTILE FROND (UNDER SIDE) OF TRICHOMANES BANCROFTII.

T. Bancroftii (Bancroft's).* *sti.* 1in. to 2in. long, broadly winged to the base. *fronds* 3in. to 6in. long, 1in. broad, ovate-oblong, pinnatifid down to a broadly-winged rachis; segments oblong, blunt, crenate, either imbricated or with a small space between them. *sori* two to six to a pinna, the mouth rather dilated; receptacle long, filiform. Tropical America. See Fig. 93. (H. G. F. 56.) Greenhouse.

T. bipunctatum (two-dotted). *rhiz.* wide-creeping, tomentose, rather slender. *sti.* 1in. to 2in. long, naked, slightly winged above. *fronds* oblong-lanceolate or oblong-deltoid, 2in. to 3in. long, about 1in. broad, tripinnatifid, the rachis winged throughout; pinnæ lanceolate, cut away on the lower side at the base; ultimate segments strap-shaped, ¼in. to ½in. long. *sori* one or more to a pinna; involucre winged. Mauritius. SYN. *T. Filicula.*

T. Bojeri (Bojer's). A synonym of *T. cuspidatum.*

T. botryoides (Botrys-like). *cau.* erect, tufted. *barren fronds* 2in. to 3in. long, 1in. or rather more broad, on very short stipes, pinnatifid to a slightly-winged rachis, with linear-oblong, deeply-toothed lobes, the apex rooting and copiously proliferous. *fertile fronds* on stipes 1in. to 2in. long, narrow-linear, the apex foliaceous. *sori*, lower ones stalked, usually free; upper ones connected at the base. Tropical America. SYN. *Feea nana.*

T. brevisetum (short-bristled). A synonym of *T. radicans.*

T. concinnum (neat). *rhiz.* filiform, tomentose. *sti.* three to four lines long, proliferous, winged upwards. *fronds* ovate, ½in. to ¾in. long, rounded at top, cuneate at base, bipinnatifid; lower pinnæ flabellately pinnatifid, the lowest pinnules bifid. *sori* usually lateral, rarely terminal; involucre immersed. Tahiti.

T. crinitum (hairy). *sti.* tufted, one to three lines long, slender, villous. *fronds* 2in. to 8in. long, ½in. to ¾in. broad, ovate-lanceolate or linear-oblong, bipinnatifid; pinnæ reaching nearly to the rachis, the lower ones ovate-oblong, cut about half-way down into broadly linear segments; surface slightly hairy; margins ciliated. *sori* one or two to a pinna, terminal, the mouth dilated. West Indies.

T. crispum (curled). *rhiz.* short or somewhat elongated, strong, tomentose. *sti.* scattered or tufted, 2in. to 6in. long, strong, tomentose. *fronds* 4in. to 12in. long, 1½in. to 2in. broad, lanceolate, fully pinnate or pinnatifid nearly to the rachis; lower pinnæ ¾in. to 1in. long, oblong, obtuse, spreading, or even deflexed often incurved and crisped; rachis clothed with reddish-brown hairs. *sori* one to eight placed round the apex of the pinnæ, the mouth two-lipped; receptacle long, exserted. Tropical America, 1828.

T. c. pilosum (pilose). *fronds* clothed with reddish hairs. 1863.

T. curvatum (curved). A synonym of *T. javanicum.*

T. cuspidatum (cuspidate). *fronds* indistinctly but very shortly stalked, about ½in. broad, the outer edge rounded and more or less lobed, the base truncate or more or less cuneate. Involucres one to six, the tube sunk in the frond, the mouth dilated, but scarcely two-lipped. Mauritius. SYN. *T. Bojeri.*

T. dissectum (dissected). A synonym of *T. auriculatum.*

T. elongatum (lengthened). A variety of *T. rigidum.*

T. erosum (bitten). *rhiz.* thread-like. *sti.* filiform, ½in. to ½in long. *fronds* very variable in shape, lanceolate to semicircular, entire or repand-pinnatifid, 1in. to 2in. long, abundantly veined. *sori* one or many placed along the upper margin of the frond; involucre immersed, cylindrical, with a large, collar-like limb. Seychelles. SYN. *T. muscoides.*

T. exsectum (scolloped). *rhiz.* wide-creeping, slender, tomentose. *sti.* slender, naked, 1in. to 3in. long. *fronds* 6in. to 12in. long, 1in. to 2in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis narrowly winged in the upper half; pinnæ distant, flaccid, the upper ones often 3in. to 4in. long, the lower ones ovate or lanceolate, divided to a narrowly-winged rachis, with a few deeply-toothed or pinnatifid pinnules. *sori* one to four to a pinna, the mouth truncate. Chili.

T. Filicula (little Fern). A synonym of *T. bipunctatum.*

T. fimbriatum (fringed). A synonym of *T. superbum.*

T. floribundum (bundle-flowered). A synonym of *T. pinnatum.*

T. gemmatum (twin). *rhiz.* strong, wiry, tomentose, beset with numerous long, black fibres. *sti.* 1in. to 3in. long, naked, wiry, winged above. *fronds* 2in. to 6in. long, 1in. to 2in. broad, erect, rather rigid, ovate-oblong, bipinnatifid, the main rachis narrowly winged; pinnæ erecto-patent, cut down to a narrowly-winged rachis; lower pinnules deeply forked; segments linear-filiform. *sori* one to eight to a pinna, minute, axillary, the tube stalked. South America.

T. Hartii (Dr. Hart's). *cau.* short, slender, sub-erect. *sti.* tufted, 2in. to 4in. long, winged in the upper part. *fronds* deltoid, 3in. to 6in. long, tripinnatifid, the main rachis distinctly winged; pinnæ eight to twelve-jugate, crowded, sessile, all except the lowest lanceolate; lowest pair lanceolate, deltoid; ultimate segments oblong, obtuse, erecto-patent. *sori* usually only one to each secondary segment, except in the deeply-pinnatifid, large ones on the lower side of the lowest pair of pinnæ. Sierra Leone, 1882.

T. humile (dwarf). *rhiz.* creeping, deeply intermatted. *sti.* ¼in. to ½in. long, slender, winged above. *fronds* 1in. to 2in. long, ¾in. broad, bipinnatifid, lanceolate-oblong, cut down to a narrowly-winged rachis; segments pinnatifid, with simple or once-forked, linear lobes. *sori* solitary on the upper side of the pinnæ, the tube more or less exserted, the mouth two-lipped. Java, &c.

T. incisum (cut). A synonym of *T. sinuosum.*

T. javanicum (Javan). *cau.* tufted, with numerous strong, wiry roots. *sti.* 1in. to 4in. long, wiry, erect, naked or villous. *fronds* 2in. to 8in. long, 1in. to 2in. broad, ovate-lanceolate, acuminate, once fully pinnate; lower pinnæ often 1in. long, ¼in. broad, obtuse or acute, finely toothed. *sori* one to four, placed in the axils of linear segments on the upper side of the pinnæ;

Trichomanes—*continued.*

receptacle much exserted. India, Java, &c. SYNS. *T. curvatum*, *T. rhomboideum*.

T. Kaulfussii (Kaulfuss'). *rhiz.* wide-creeping, strong, tomentose. *sti.* 2in. to 4in. long, strong, compressed, winged above. *fronds* 4in. to 12in. long, 1½in. to 2in. broad, ovate-lanceolate, acuminate, once-pinnatifid down to a broadly-winged rachis; segments linear-oblong, rounded or acute, toothed, the largest 1in. long, ¼in. broad; main rachis densely, and the surface slightly, hairy. *sori* two to twelve to a pinna, the tube more or less exserted; receptacle long, filiform. West Indies, 1862.

FIG. 94. TRICHOMANES KRAUSSII.

T. Kraussii (Krauss').* *rhiz.* wide-creeping, tomentose. *fronds* sessile or nearly so, 1in. to 3in. long, ¼in. broad, oblong, attenuated or cuneate at base, once deeply pinnatifid down to a broadly-winged rachis; lobes linear-oblong, nearly entire, or toothed or sinuate-pinnatifid. *sori* one to six on the apex of the frond, the tube more or less exserted, the mouth with two large lips. West Indies. See Fig. 94. Greenhouse.

T. labiatum (lipped). *fronds* variable in shape, roundish and cordate at one or both ends, or sub-ovate and narrowed at base and apex, pellucid dark green; fertile ones with a distinct midrib. *sori* confined to the apex, usually one, rarely two to four; involucres tubular, free or slightly sunk, with tufts of hairs on the margined sides; lips large, expanded and rounded. British Guiana, 1885.

T. Luschnatianum (Luschnat's). A variety of *T. radicans*.

T. maximum (greatest).* *rhiz.* stout, creeping. *sti.* strong, erect, 3in. to 6in. long. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, ovate, quadripinnatifid; pinnæ erecto-patent, ovate-lanceolate, the largest 4in. to 6in. long, 2in. broad; pinnules lanceolate-deltoid, 1in. or more long, cut down to the rachis into segments, which are again deeply pinnatifid; ultimate segments ⅛in. to ¼in. long. *sori* two to eight to a pinnule; involucre cylindrical, the mouth two-lipped. Java, 1863. SYN. *T. anceps* (H. S. F. i. 40c, 3). Greenhouse.

T. meifolium (Spignel-leaved). A synonym of *T. apiifolium*.

T. membranaceum (membranous). *fronds* sub-sessile, membranous, sub-orbicular, 2in. to 3in. broad, more or less deeply cut from the circumference towards the centre; lobes broad, rounded, or narrow, the margin fringed with a double series of peltate scales. Involucres numerous, placed round the edge of the frond, the tube sunk, the mouth two-lipped. Tropical America. (H. E. F. 76.)

T. muscoides (Moss-like). A synonym of *T. erosum*.

T. obscurum (obscure). A synonym of *T. rigidum*.

T. parvulum (rather small). *rhiz.* wide-creeping, interlaced. *sti.* 1in. long, wiry, slender, tomentose below. *fronds* ¼in. to ½in. each way, orbicular, flabellately cut about half-way down from the outer edge towards the base into narrow, irregular segments. *sori* four to six, terminal on the central segments. Japan and China, &c. Greenhouse. (H. S. F. 39A.)

T. Petersii (Peters'). *sti.* one to two lines long. *fronds* ½in. to ¾in. long, linear to obovate-spathulate, crenate or slightly lobed. *sori* solitary, terminal, the tube sunk in the frond, the mouth much dilated, but entire. United States, 1875. Greenhouse.

Trichomanes—*continued.*

T. pinnatinerva (pinnate-nerved). *rhiz.* dark, tomentose, thread-like. *sti.* a quarter to one line long. *fronds* scattered, ovate, two to three and a-half lines long, one to two lines broad, pellucid, clear, bright green. British Guiana, 1886. A very minute Filmy Fern.

T. pinnatum (pinnate). *cau.* erect, tufted. *sti.* strong, wiry, erect, naked or slightly hairy, 3in. to 12in. long. *fronds* simply pinnate in the typical state, 4in to 18in. long, 3in. to 12in. broad, the apex often rooting and proliferous; pinnæ in two to ten opposite or alternate pairs and a terminal one, 2in. to 6in. long, linear, obtuse or acute, sharply and finely toothed, the upper edge usually free from the stem at the base, the under one attached and often furnished with a broad, decurrent wing. *sori* placed all round the pinnæ; receptacle long, exserted. Tropical America, 1825. SYN. *T. floribundum*.

T. Pluma (feathery). *rhiz.* short-creeping, clothed with bright brown scales. *sti.* 2in. to 4in. long, terete, wiry. *fronds* lanceolate, 4in. to 6in. long, 1in. to 1½in. broad, decompound; rachis stiff, terete throughout; pinnæ crowded, twenty to thirty-jugate, spreading, less than ½in. broad; lower pinnules sparsely pinnatifid, cut into distant, bristle-like, dichotomously-forked lobes, ⅛in. to ¼in. long. *sori* few, placed near the base of the upper pinnæ; receptacle very long. Malay Isles.

T. punctatum (dotted). *fronds* stalked or sub-sessile, ¼in. to ½in. broad, sub-orbicular or obovate, undulated or slightly lobed at the margin. *sori* one to four, placed on the outer edge of the frond and more or less exserted, the mouth distinctly two-lipped. Tropical America.

T. pusillum (dwarf). *rhiz.* wide-creeping, tomentose. *fronds* nearly sessile, 2in. to 3in. long, ½in. to 1in. broad, oblong or obovate, cuneate-attenuated below, once deeply pinnatifid down to a broadly-winged rachis; lobes linear or oblong, toothed or deeply pinnatifid. *sori* one to four round the apex of the frond, the tube exserted, the mouth with two large, rounded lobes. Tropical America. SYN. *T. quercifolium*.

T. pyxidiferum (box-bearing).* *rhiz.* wide-creeping, tomentose, rather slender. *sti.* 1in. to 2in. long, naked, winged above. *fronds* 1in. to 6in. long, 1in. to 1½in. broad, ovate-oblong, tripinnatifid, the main rachis very narrowly winged; pinnæ ovate-rhomboidal, pinnatifid to the rachis, the lower pinnules again deeply pinnatifid; ultimate segments often emarginate at apex. *sori* one to four to a pinna, axillary, the tube more or less winged; receptacle filiform, exserted. Tropical America. Greenhouse.

T. quercifolium (Oak-fronded). A synonym of *T. pusillum*.

T. radicans (rooting).* Cup Goldilocks; Killarney Fern. *rhiz.* wiry, wide-creeping, tomentose. *sti.* strong, wiry, ascending, 2in. to 6in. long, naked or nearly so, the upper part sometimes winged. *fronds* 4in. to 12in. long, 2in. to 6in. broad, tripinnatifid, the main rachis very narrowly winged, often free, except near the apex; lower pinnæ 1in. to 4in. long, ovate-rhomboidal, cut down to a narrowly-winged rachis; pinnules again deeply pinnatifid, ovate-rhomboidal, with deeply-toothed lower segments. *sori* lateral, one to four to a pinnule, the tube small, more or less exserted; receptacle slender, elongated. Europe (Britain). Hardy. SYN. *T. brevisetum*.

T. r. Andrewsii (Andrews'). *fronds* deep green, narrow-lanceolate; pinnæ more distant than in the species, narrower and erect. A distinct and handsome, hardy, Irish variety.

T. r. dilatatum (dilated). *fronds* very dark green, much less divided than in the type; pinnæ and pinnules broadly winged. Hardy.

T. r. Luschnatianum (Luschnat's). *fronds* lanceolate, acuminate, quite sessile. Brazil. Stove.

T. reniforme (kidney-shaped). *sti.* 4in. to 8in. long, naked, wiry. *fronds* orbicular-reniform, entire, with a deep sinus at the base, 2in. to 4in. broad. *sori* often encircling the whole of the outer margin; receptacle much exserted, stout, and covered with capsules. New Zealand. Greenhouse.

T. reptans (creeping). *sti.* ½in. long. *fronds* ½in. to ½in. each way, obovate-cuneate, often with short, blunt lobes. *sori* one to four, placed on the outer margin, the tube partially or quite exserted, the mouth distinctly two-lipped. Tropical America. This is very closely allied to *T. punctatum*.

T. rhomboideum (rhomboid). A synonym of *T. javanicum*.

T. rigidum (rigid).* *sti.* tufted, erect, wiry, 2in. to 8in. long, naked or very slightly winged above. *fronds* 2in. to 8in. long, 2in. to 6in. broad, deltoid or ovate, acuminate, tri- or quadripinnatifid, the main rachis usually only slightly winged towards the top; lower pinnæ 2in. to 3in. long, erecto-patent, ovate or lanceolate-rhomboid, cut down to a rachis which is very narrowly winged throughout or free below; pinnules deeply pinnatifid, with deeply-toothed or even pinnatifid, linear lobes. *sori* two to twelve to a pinnule, small, axillary, the tube more or less exserted. New Zealand, &c. Stove or greenhouse. SYNS. *T. achilleæfolium*, *T. obscurum*.

T. r. elongatum (lengthened). *fronds* deltoid, with broader segments; pinnæ and pinnules often imbricated.

T. rufum (reddish). *sti.* (and under side of the fronds) most profusely covered with long, rufous, woolly hairs. *fronds* pale green above, about 10in. long and 1½in. broad, pinnate; pinnæ

Trichomanes—*continued.*

overlapping each other, the veins exserted at their tips. Demerara. A very rare, distinct, erect-growing Fern.

T. saxatile (rock-loving). *sti.* terete, hairy. *fronds* tufted, triangular-ovate, pinnate below; pinnæ bipinnatifid, the upper ones decurrent; pinnules ovate, the margins more or less decurved, giving the surface a pretty, undulating character; ultimate segments broad, short, obtuse-pointed. Involucres cylindrical, supra-axillary, slightly two-lipped. Borneo, 1862. A dwarf but very pretty species.

T. scandens (climbing). *rhiz.* wiry, wide-creeping. *sti.* strong, erect, naked, 2in. to 4in. long. *fronds* 6in. to 18in. long, 3in. to 6in. broad, fully pinnate, or the hairy rachis very slightly winged above, ovate, acuminate; lower pinnæ ovate-lanceolate, nearly pinnate, 2in. to 4in. long; pinnules divided down to a narrow wing; segments again pinnatifid about half-way down; margins finely hairy. *sori* one to four to a pinnule, the mouth with two lateral projections. Mexico, &c., 1862.

T. Sellowianum (Sellow's). *sti.* clothed with short hairs. *fronds* bright green, linear-lanceolate, deeply pinnatifid; segments oblong, obtuse, waved at the edges, where there are a few hairs. Brazil. An extremely rare plant in cultivation.

T. setigerum (bristle-bearing). *sti.* quite terete, 2in. to 6in. long, furnished with hair-like scales. *fronds* tufted, 9in. to 15in. long, linear or linear-lanceolate, pinnate, smooth, curving: pinnæ bipinnatifid; pinnules palmate; ultimate segments elongated and very narrow, almost capillary, the lower ones incurved, sub-erect. Involucres supra-axillary, small, subcylindrical, terminal on a narrow segment. Borneo, 1862.

T. sinuosum (waved). *rhiz.* wide-creeping, sinuous, rather strong. *sti.* varying from hardly any to 2in. long. *fronds* 2in. to 9in. long, 1in. to 1½in. broad, linear-lanceolate, very gradually decurrent below, pinnatifid down to a broadly-winged rachis; lobes oblong, obtuse, crenate-margined. *sori* two to four to each lobe; receptacle much exserted. Tropical America. SYN. *T. incisum.*

T. spicatum (spicate). *cau.* erect, tufted. *barren fronds* 4in. to 6in. long, 1in. to 1½in. broad, on stipes 1in. to 2in. long, pinnatifid nearly to the rachis, the apex not rooting; segments inciso-crenate, linear-oblong. *fertile fronds* composed of a rachis and two rows of sori, without any connecting membrane. West Indies. (H. G. F. 60.) SYN. *Feea polypodina.*

T. superbum (superb). *rhiz.* strong, wide-creeping. *sti.* 2in. to 5in. long, strong, winged nearly down to the base. *fronds* 4in. to 9in. long, 2in. to 4in. broad, broadly ovate, pinnatifid down to a narrowly-winged rachis; lower pinnæ lanceolate, divided more than half way to the rachis, with oblong, crenate lobes. *sori* two to six to each lobe; receptacle long, filiform. Trinidad, 1863. SYN. *T. fimbriatum.*

T. tenerum (slender). *rhiz.* creeping, tomentose, very slender. *sti.* 1in. to 2in. long, slender, naked. *fronds* 3in. to 8in. long, 1in. to 1½in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis only very slightly winged towards the apex; pinnæ distant, flaccid, cut down to a narrowly-winged rachis, with distant, deeply-incised or pinnatifid pinnules; ultimate segments about two lines long. *sori* one to four to a pinna, the tube exserted. Tropical America. SYN. *T. angustatum.*

T. trichoideum (hair-like).* *rhiz.* creeping, slender. *sti.* 1in. to 2in. long, very slender, naked. *fronds* 4in. to 8in. long, 1in. to 2in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis only slightly winged at the apex; pinnæ flaccid, 1in. to 2in. long, the rachis only winged above; pinnules deeply cut, with distant, linear-filiform segments one to two lines long. *sori* one to four to a pinna, the tube exserted, sometimes stalked. West Indies, 1862. Greenhouse.

T. trichophyllum (hair-fronded). *sti.* densely tufted, wiry, terete, 1in. to 2in. long. *fronds* 2in. to 4in. long,

Trichomanes—*continued.*

1in. to 1½in. broad, oblong, decompound; rachis stiff, terete throughout; pinnæ twelve to fifteen-jugate, much imbricated, many of them deltoid, ¼in. broad; lower pinnules copiously pinnatifid; ultimate divisions bristle-like, ⅛in. to ¼in. long, spreading in all directions. *sori* copious, free, placed near the base of the pinnules on the upper side. Borneo and New Caledonia, 1862.

T. venosum (veined). *rhiz.* slender, wide-creeping. *sti.* 1in. to 2in. long, very slender, naked. *fronds* 2in. to 5in. long, 1in. to 1½in. broad, pinnatifid, the main veins free in the lower half, broadly winged above; lower pinnæ about 6in. long, varying from linear and nearly simple to lanceolate and deeply pinnatifid below. *sori* only one to a pinna, axillary on the upper margin, the tube slightly two-lipped. Australia and New Zealand. Greenhouse.

TRICHONEMA. A synonym of *Romulea.*

TRICHOPETALUM (from *thrix, trichos*, a hair, and *petalon*, a petal; the inner perianth segments are fringed). ORD. *Liliaceæ.* A monotypic genus. The species is a curious, half-hardy, perennial herb, with a thick rhizome, and fascicled, fleshy or tuberous root fibres. A light, rich soil is most suitable. The plant succeeds in a pit, or in an effectively-drained frame, with a southern aspect. It will also thrive in pots, if ample drainage be afforded. Propagation may be effected by divisions.

FIG. 95. TRICHOPILIA SUAVIS.

Trichopetalum—*continued.*

T. gracile (slender). A synonym of *T. stellatum.*

T. stellatum (star-like). *fl.*, perianth greenish, six to seven lines long, the outer segments keeled, the inner ones densely bearded; pedicels ascending; raceme straight, rather loose, few-flowered, simple or slightly forked, 3in. to 6in. long; scape 6in. to 12in. long, with one to three bracts (reduced leaves). Early summer *l.* six to eight, narrow-linear, glabrous, Grass-like, 4in. to 12in. long. *h.* 1ft. to 3ft. Chili, 1828. SYNS. *T. gracile* (B. R. 1535), *Anthericum plumosum* (B. M. 3084). The correct name of this plant is *Bottionea thysanotoides.*

TRICHOPHORUM. Included under *Eriophorum.*

TRICHOPHYLLUM. A synonym of **Bahia** (which *see*).

TRICHOPILIA (from *thrix, trichos,* a hair, and *pilion,* a cap; the anther is concealed below a cap surmounted by three tufts of hair). SYNS. *Leucohyle, Pilumna.* Including *Helcia, Oliveriana.* ORD. *Orchideæ.* A genus embracing about sixteen species of beautiful, greenhouse, epiphytal Orchids, inhabiting the warmer parts of America. Flowers showy, pedicellate; sepals sub-equal, free, narrow, erecto-patent, often twisted; petals similar; lip with the claw adnate to the column, which it closely invests above, the limb spreading, the slightly-dilated lateral lobes connivent, the middle one continuous and undulated; pollen masses two, obovoid-oblong, exappendiculate; bracts small; scapes springing from a short rhizome, leafless, few-sheathed, one, two, or rarely three to five, flowered. Leaf fleshy, erect, complicated at base, narrow or rather broad. Pseudo-bulbs one-leaved. Trichopilias may be grown in pots, or in hanging baskets; in the latter their flowers are seen to the best advantage. The plants should be kept well elevated above the rims of the pots or baskets, in order that good drainage may be insured; the flower scapes also proceed from beneath the leaves and pseudo-bulbs. Fibrous peat and living sphagnum, with some pieces of charcoal intermixed, afford a suitable compost. A moderate supply of water should be given during the growing season, but very little is requisite in winter; still, the plants must not be allowed to suffer for want of it. Trichopilias in good health blossom very freely; the plants succeed best in the Mexican house. Sickly specimens—the result of growing in too high a temperature—are frequently met with. Propagated by carefully-made divisions.

T. albida (whitish). *fl.*, sepals and petals pale greenish-yellow, nearly straight, the margins slightly hyaline; lip longer than the petals, four-lobed; the lobes whitish, the throat with scattered, ochraceous-yellow dots; hood trilobed; raceme pendulous, about three-flowered. *l.* oblong-lanceolate, flat, sub-cordate at base, acuminate at apex, recurved. Caraccas, 1851.

T. Backhousiana (Backhouse's). *fl.* more fleshy than in *T. fragrans* (which this species closely resembles); lip much narrower and lobed near each end, but twice as broad in the middle as that of *T. fragrans. l.* faintly spotted and clouded with darker patches. New Grenada, 1876. Whole plant paler green than *T. fragrans.*

T. coccinea (scarlet). A garden synonym of *T. marginata.*

T. crispa (curled).* *fl.*, sepals and petals light cherry-crimson, faintly edged with white, the margins crispate-crenate; lip white outside, somewhat deeper in colour than the sepals, large, the margin irregularly crisped, the throat rich deep crimson. April to June. Central America, 1857. A charming and rare species, resembling *T. marginata.*

T. c. marginata (margined). *fl.* large and very showy; sepals and petals pale purplish-red, white at the edges; lip white externally, the central lobe dull crimson, the throat of a darker and richer crimson, the limb narrowly edged with white. (F. d. S. 1925-6; W. S. O. i. 5.)

T. fragrans (fragrant).* *fl.* deliciously sweet-scented; sepals and petals pale yellowish-green, 2½in. to 3in. long, wavy, and slightly twisted; lip pure white, orange-spotted towards the base; racemes pendent, three or four together. Winter.

FIG 96. FLOWER OF TRICHOPILIA SUAVIS (natural size).

l. broadly oblong-lanceolate. Pseudo-bulbs oblong, 4in. to 6in. long, slightly compressed. New Grenada, 1858. SYN. *Pilumna fragrans* (B. M. 5035).

T. fragrans (fragrant). A garden synonym of *T. nobilis.*

T. Galeottiana (Galeotti's).* *fl.*, sepals and petals cuneate-lanceolate, acute, the latter somewhat broader, pale green, with a central bar of olive-brown; lip closely folded round the column, the front lobe obreniform, the disk pale yellow, with bars and lines of crimson-purple, the margin passing to white; peduncles one-flowered. August and September. *l.* cuneate-oblong, acute, dark green. Pseudo-bulbs tall, ligulate, ancipitous. Mexico, 1860. SYNS. *T. picta* (I. H. 225), *T. Turialvæ,* of Bateman (B. M. 5550).

T. grata (pleasing). *fl.* sweetly-scented; sepals and petals yellowish-green; lip expanded, white, blotched with yellow on each side of the keel; racemes few-flowered. *l.* oblong-ligulate. Pseudo-bulbs elongated, ancipitous, two-leaved. Peru, 1868. This species is allied to *T. fragrans.*

T. hymenantha (membrane-flowered). *fl.* white, small; sepals

Trichopilia—*continued.*

and petals slightly twisted; lip sessile, nearly flat, with erose edges, speckled with deep sanguineous-purple towards the base and sides; racemes six to eight-flowered, drooping. Summer. *l.* thick, fleshy, elongated-ensiform, acuminate, narrowed to the base, the lower part representing a stem or pseudo-bulb. New Grenada, 1854. (B. M. 5949; R. X. O. i. 7.)

T. Kienastiana (Kienast's). *fl.* white, with a few yellow lines or spots on the disk of the lip; sepals and petals linear-ligulate; lateral lobes of lip median, obtuse-angled; anterior lobes porrected, wavy, emarginate; peduncle usually two-flowered. *l.* and pseudo-bulbs much like those of *T. suavis*. Habitat unknown. 1883.

T. lepida (pretty). *fl.* handsome, 4in. to 5in. in diameter; sepals and petals pale rosy-lilac, irregularly margined with white; lip prominent, fimbriated, in front deep purple-crimson with an irregular margin of white; peduncles deflexed. Spring. *l.* oblong-ovate, acute, leathery. Pseudo-bulbs oblong, obtuse, ancipitous. Costa Rica, 1873. (F. M. ser. ii. 98; W. O. A. v. 197.)

T. marginata (margined).* *fl.* 4in. to 5in. across; sepals and petals brownish-red, with greenish-yellow margins, narrow, once twisted; lip white outside, the mouth three-lobed, the lateral lobes roundish and the central ones emarginate, wavy, reddish-purple, sometimes edged with white, becoming deep crimson in the throat, or with the limb white and the throat only deep crimson; peduncles drooping, one-flowered. May and June. *l.* lanceolate, shortly acuminate, recurved at tip. Pseudo-bulbs clustered, oblong, furrowed, recurved at tip. Central America, 1880. (G. M. B. iii. 185.) SYN. *T. coccinea* (B. M. 4857; L. J. F. 184; L. & P. F. G. ii. 54).

T. m. flaveola (yellowish). *fl.*, sepals and petals greenish-yellow; lip and column white. 1880.

T. mutica (beardless). *fl.* dirty-white, slightly tinged with red; sepals and petals linear, acute; lip parallel with the column, cordate-ovate, cucullate at base; raceme few-flowered, weak. August. *l.* linear-lanceolate, convex at back. Said to be a native of Trinidad, 1821. SYN. *Macradenia mutica*.

T. nobilis (noble).* *fl.* larger than those of *T. fragrans*, sweet-scented; sepals and petals white, undulated; upper lobes of lip rounded and meeting over the throat, the front one pure snow-white, 1½in. broad, having on each side of the throat an orange-coloured blotch, the two blotches meeting to form a central, eye-like spot; scapes erect, four or five-flowered. *l.* broadly oblong, acute. Pseudo-bulbs elongated, oblong, compressed, clustered. Columbia. A beautiful species, perhaps a variety of *T. fragrans* (under which name it is figured in F. M. ser. ii. 21, I. H. ser. iii. 94, and W. O. A. iii. 128).

T. picta (painted). A synonym of *T. Galeottiana*.

T. rostrata (beaked). *fl.*, sepals and petals pale whitish-green, linear, acute, the petals twice twisted; lip white, with pale orange rays, flabellate, trifid towards the apex; peduncle two-flowered. *l.* broadly ligulate, acute. Pseudo-bulbs linear-lingulate, the basilar scales slightly dotted. New Grenada, 1872.

T. sanguinolenta (dark-bloody). *fl.* rather showy, 2½in. across; sepals and petals yellowish-olive, marked with transverse bands or ocellate markings of brownish-crimson; lip emarginate, recurved, white, flabellately veined, the veins in the basal half marked out by broken lines of crimson. *l.* undulated, petiolate, 4in. to 6in. long. Pseudo-bulbs ovate, elongated. Ecuador, 1843. SYN. *Helcia sanguinolenta* (I. H. ser. iii. 21; L. & P. F. G. ii. 182).

T. suavis (sweet).* *fl.* white or creamy-white, delicately Hawthorn-scented; sepals and petals narrowed to the base, scarcely twisted; lip yellow in the throat, spotted with pale violet-rose on the front part and on the sides, closely rolled up at the base, spread out in a funnel-shaped form, three-lobed in front; peduncles three or four-flowered. March and April. *l.* large, broad-oblong, acute, wavy, nearly sessile. Pseudo-bulbs oblong-obcordate, ancipitous, clustered. Costa Rica, 1850. A fine species. See Figs. 95 and 96. (B. M. 4654; F. d. S. 761; L. J. F. 227; L. & P. F. G. i. 11; W. S. O. iii. 8.)

T. s. alba (white). *fl.*, sepals and petals pure white; lip white, marked in the throat with a yellow stain. May and June. (W. O. A. i. 14.)

T. s. grandiflora (large-flowered). *fl.* more highly coloured than in the type, and expanding better; sepals and petals white; lip upwards of 3in. in diameter, white, with large, rich crimson spots, the throat deep orange. *l.* (as well as the pseudo-bulbs) very large. A lovely variety.

Trichopilia—*continued.*

T. tortilis (twisted). *fl.* drooping, large and attractive; sepals and petals yellowish-green, with lurid brownish-purple blotches along the middle part, spirally twisted, narrow-lanceolate; lip white outside, yellowish-white or white within, thickly spotted with rose-colour and blotched with yellow about the throat, the base closely rolled in, the front part spreading out and three-lobed; peduncle one-flowered. *l.* oblong, acute. Pseudo-bulbs oblong or ligulate, compressed, 2in. to 4in. long. Mexico, 1835. An interesting species. See Fig. 97. (B. iii. 122; B. M. 3739; B. R. 1863.) There are several varieties of this species. One — *candidum* — has white, and another brighter-coloured, flowers.

FIG. 97 FLOWER AND LEAF OF TRICHOPILIA TORTILIS.

T. Turialvæ (Turialva), of Bateman. A synonym of *T. Galeottiana*.

TRICHOPTERIS. Included under *Alsophila*.

TRICHOS. A term, used in Greek compounds, signifying hair-like or hairy; *e.g.*, *Trichocentron*, *Trichomanes*.

TRICHOSACME (from *thrix*, *trichos*, a hair, and *acme*, a point; referring to the corolla's hairy appendage). ORD. *Asclepiadeæ*. A monotypic genus. The species is a stove, climbing shrub, densely white-woolly on all parts except the corolla. For culture, *see* **Stapelia.**

T. lanata (woolly). *fl.* purple, mediocre or rather small, six to ten in umbelliform cymes; calyx of five lanceolate segments; corolla with a short, rotate tube, the lobes emarginate, the teeth produced in a long, filiform appendage; peduncles opposite the leaves. July. *l.* opposite, petiolate, cordate at base, elliptic or oblong, obtuse or slightly acute. Mexico, 1850. (F. d. S. 1123; L. & P. F. G. i. 105.)

TRICHOSANTHES (from *thrix, trichos*, a hair, and *anthos*, a flower; alluding to the fringed corolla). Snake Gourd. Including *Eopepon*. ORD. *Cucurbitaceæ*. A genus comprising about thirty species of stove, greenhouse, or half-hardy, climbing, annual or perennial herbs, sometimes shrubby at base, occasionally tuberous-rooted; they are found in tropical Asia, North Australia, and Polynesia. Flowers white, dicœcious, less often monœcious; calyx long-tubular, with five lanceolate, entire, serrated, or torn segments; corolla five-cleft nearly to the base, the lobes long-fringed. Stamens of the males three; peduncles usually in axillary pairs, one one-flowered and caducous, the other racemose; bracts occasionally wanting. Female flowers solitary; ovary inferior, at the base of the calyx tube, one-celled, the style three or six-cleft at apex. Fruit lanceolate or globose, smooth, often large. Leaves entire or three to nine-lobed, denticulate; tendrils usually two or three-cleft. The common name of *T. anguina* refers to its fruits, which are eaten as a vegetable in India. Seeds of the species here described should be sown on a hotbed, in spring, and the plants afterwards treated like Cucumbers.

FIG. 98. TRICHOSANTHES ANGUINA, showing Portion of Stem, with Fruit and Male Flowers, and detached Cluster of Flowers.

Trichosanthes—*continued.*

T. anguina (snake-like).* Common Snake or Viper Gourd; Serpent Cucumber. *fl.*, calyx tube lin. long; the earlier male peduncle occasionally replaced by a female. *fr.* elongated, cylindrical, sometimes twisted, edible. *l.* cordate-sub-reniform, three to seven-lobed or five-angular; lobes pubescent or puberulous on both surfaces, not acuminate. Stems twining, more or less pubescent. India, &c., 1735. Half-hardy. See Fig. 98. (B. M. 722.) SYN. *T. colubrina* (B. R. xxxii. 18).

T. colubrina (snake-like). A synonym of *T. anguina*.

T. japonica (Japanese). *fl.*, male racemes few-flowered; bracts large, broadly ovate, deeply subulate-toothed; peduncle robust, sulcate. *fr.* ovoid, slightly acute at base and apex. *l.* membranous, broadly ovate, glabrous and smooth, three to five-lobed; lobes triangular, acute, entire or undulate-denticulate on the margins. Stem slender. Japan, 1872. Greenhouse. (R. G. 714.)

T. Kirilowii (Kirilow's). *fl.* dicœcious; male racemes few-flowered at apex, the bracts acutely toothed. *fr.* ovoid or ovoid-oblong. *l.* sub-orbicular, often deeply palmately five to seven-lobed; lobes oblong or oblong-lanceolate, acute, deeply incised-serrated or lobulate. Stem annual, branched. Root perennial. China, 1872. Greenhouse. SYN. *Eopepon vitifolius*.

T. palmata (palmate-leaved).* *fl.*, male racemes on long, stout peduncles, at first short and head-like, at length elongated, with a toothed or jagged bract, at least 1in. across, under each pedicel; female flowers shortly pedicellate. *fr.* nearly globular, 2in. to 3in. in diameter. *l.* broad, palmately three to seven-lobed, pubescent. India and North Australia, 1825. Stove. (B. M. 6873.)

T. tuberosa (tuberous-rooted). *fl.*, corolla white, the tube intimately united and incorporated with the tube of the calyx; limb free, of five long, deeply bifid segments, the divisions forked at the extremity. September. *l.* distant, formed of three deeply-cut, linear-oblong, divaricating lobes, acute at the points, the lower ones with a smaller, unidentate lobe at the base. Stems green, climbing. Root a large, rounded tuber. West Indies. Stove. (B. M. 2703.)

TRICHOSMA (from *treis*, three and *chosma*, a division; in allusion to the three-lobed labellum). ORD. *Orchideæ*. A monotypic genus. The species is a very distinct and scarce, stove, epiphytal Orchid. It may be grown in a well-drained pot or pan of fibrous peat and sphagnum. When in active growth, it must be kept moderately moist; and, as it has no fleshy pseudo-bulbs, it must never be allowed to get quite dry.

Trichosma—*continued.*

T. suavis (sweet). Hair Orchid. *fl.* fragrant, rather large, in a short, terminal raceme; sepals and petals creamy-white, lanceolate; lip three-lobed, the side lobes white, striped with brownish-crimson, the middle one undulated, recurved, yellow, margined with crimson, and bearing several crispy crests on the disk. Spring. *l.* two, broadly lanceolate, obsoletely three-nerved. Stems thin, tufted, terete, 8in. to 10in. high. Khasya Mountains, 1840. (B. R. 1842, 21; W. O. A. iii. 114.) SYNS. *Cœlogyne coronaria, Eria coronaria, E. suavis.*

TRICHOSORUS. Included under *Alsophila.*

TRICHOSPORUM. A synonym of **Æschynanthus** (which *see*).

TRICHOSTEMA (from *thrix, trichos*, hair, and *stema*, stamen; referring to the capillary filaments). Blue Curls. ORD. *Labiatæ.* A genus comprising about half-a-dozen species of hardy, North American herbs. Flowers commonly blue or violet, in axillary, dense or loose, many-flowered whorls. Leaves entire; floral ones conformed. Two of the species have been introduced, but they are probably not now in cultivation.

FIG. 99. FLOWERING BRANCH OF TRICUSPIDARIA HEXAPETALA.

TRICHOTOMOUS. Branching in threes.

TRICLISSA. A synonym of **Kniphofia** (which *see*).

TRICOCCUS. A fruit consisting of three cocci, or elastically-dehiscing shells.

TRICOLOR. Three-coloured.

TRICONDYLUS. A synonym of **Lomatia** (which *see*).

TRICORYNE (from *treis*, three, and *koryne*, a club; in allusion to the form of the capsules). ORD. *Liliaceæ*. A genus embracing six species of greenhouse perennials with fibrous roots, limited to Australia. Flowers in terminal umbels, with small, imbricated, scarious bracts; perianth spirally twisted after flowering, but at length deciduous, of six narrow, three or five-nerved segments; stamens six, hypogynous. Leaves few and Grass-like or all reduced to scarious scales. Stems usually wiry and branching, the branches often clustered. It is doubtful whether any of the species are in cultivation. *T. elatior* thrives in light, rich soil, and may be increased by divisions.

T. elatior (taller). *fl.*, perianth white, usually about ⅛in. long; umbels three, four, or six-flowered. June. *l.*, lower ones often Grass-like, 2in. to 4in. long, the upper ones, and sometimes all, reduced to short scales. Stem 1ft. to 2ft. high. 1824.

TRICRATUS. A synonym of **Abronia** (which *see*).

TRICUSPIDARIA (from *tricuspis*, three-pointed; alluding to the petals). SYN. *Tricuspis*. ORD. *Tiliaceæ*. A small genus (two species) of Chilian, greenhouse trees. Flowers rather large; calyx campanulate, truncate, obsoletely five-toothed, afterwards cut and deciduous; petals five, three-toothed or three-lobed, induplicate-valvate; stamens numerous, inserted above the torus; peduncles axillary, solitary, one-flowered. Leaves alternate and opposite, serrated. *T. hexapetala*, the only species introduced, is a very beautiful, greenhouse shrub. For culture, *see* **Correa.**

T. hexapetala (six-petaled). *fl.* red, on long peduncles. Capsule sub-rotund, silky-pilose. *l.* oblong-lanceolate, serrated or rarely entire. See Fig. 99. (Gn., Nov. 1880, under name of *Crinodendron Hookerianum.*)

TRICUSPIS (of Palisot de Beauvois). Included under **Triodia** (which *see*).

TRICUSPIS (of Persoon). A synonym of **Tricuspidaria** (which *see*).

TRICYRTIS (from *treis*, three, and *kyrtos*, convex; alluding to the three outer perianth segments having bags at their base). SYNS. *Compsanthus*, *Compsoa*. ORD. *Liliaceæ*. A small genus (five species) of half-hardy perennials, with shortly-creeping rhizomes, natives of the Himalayas, Japan, and China. Flowers few, rather large, on longish pedicels; perianth often elegantly spotted within, campanulate; segments distinct from the base, lanceolate, the outer ones saccate at base, the inner ones flat, all spreading above; stamens six, hypogynous; inflorescence terminal or in the upper axils, loosely dichotomous, erect. Leaves alternate, ovate or oblong, contracted, sub-sessile, or cordate-amplexicaul at base. Stem erect, simple below the inflorescence, leafy. The three species introduced are ornamental plants. They thrive in a compost of sandy loam and peat, and require the shelter of a greenhouse or cold pit in winter. Propagation may be effected by offsets.

T. elegans (elegant). A synonym of *T. pilosa*.

T. hirta (hairy).* Japanese Toad Lily. *fl.* six to fifteen, racemose or sub-corymbose; perianth nearly 1in. long, the segments white, the outer ones decorated with large, purple dots. May. *l.* oblong, cuspidate, cordate-amplexicaul, 4in. to 6in. long, slenderly pilose, Stem 1ft. to 3ft. high, clothed with soft, white, slightly spreading pili. Japan, 1863. See Fig. 100. (B. M. 5355.)

T. macropoda (large-footed).* *fl.* on pedicels ½in. to ⅔in. long, disposed in a loose corymb; perianth whitish-purple, with minute, purple dots, nine to ten lines long. May. *l.* oblong, acute, 4in. to 5in. long, 1½in. to 2in. broad, sessile or very shortly petiolate,

Tricyrtis—*continued.*

rounded at base, glabrous above, pubescent beneath. Stem 2ft. to 3ft. high. Japan and China, 1869. (B. M. 6544; R. G. 613.)

T. m. striata (striped). A pretty plant, having leaves striped with white. (F. d. S. 1820, under name of *T. foliis albo-striatis.*)

FIG. 100. TRICYRTIS HIRTA, showing Habit, and Portion of Stem, with Flower.

T. pilosa (pilose). *fl.* many, loosely corymbose; perianth eight to nine lines long, the segments whitish, marked with large, purple spots. May. *l.* oblong, cuspidate, cordate-amplexicaul, 4in. to 6in. long, slenderly pilose. Stem 2ft. to 4ft. high, pilose. Himalayas, 1851. (B. M. 4955; F. d. S. 1219.) SYN. *T. elegans.*

TRIDAX (from *Thridax*, the old Greek name used by Dioscorides for the Lettuce, from *treis*, three, and *akis*, a point; alluding to the ray florets). SYNS. *Balbisia* (of Willdenow), *Bartolina*. Including *Galinsogea* and *Ptilostephium*. ORD. *Compositæ*. A genus embracing seven species of hardy, perennial herbs, natives of tropical America. Flower-heads yellow, or the disk greenish, mediocre, long-pedunculate, heterogamous; ray florets ligulate or sub-bilabiate, the outer lip large, sometimes three-toothed, three-cleft, or three-parted, the inner smaller or minute, two-lobed or two-parted, sometimes obsolete; involucral bracts in few series; receptacle flat or convex; achenes turbinate, silky-villous. Leaves opposite, incised-toothed or pinnately dissected; segments few, narrow. The species possess but little beauty, and require ordinary culture. Propagated by divisions, or by seeds.

T. coronopifolium (Coronopus-leaved). *fl.-heads* yellow; ray florets unequally five-lobed; outer involucral scales obtuse or mucronate. June. *l.* variously pinnatifid or trifid; lobes linear, acute. *h.* 1ft. Mexico. SYN. *Ptilostephium coronopifolium.*

T. trilobata (three-lobed). *fl.-heads* yellow; ray florets five-toothed; pappus bristles very short and scarcely pinnately lobed, or longer and plumose-fimbriate; peduncles pubescent or glandular-puberulous at apex. June. *l.* three-lobed or pinnately incised. *h.* 1ft. Mexico. SYN. *Galinsogea trilobata* (B. M. 1895; S. B. F. G. 56).

TRIDENS. Included under **Triodia** (which *see*).

FIG. 101. TRIDENTATE LEAF.

TRIDENTATE. Trident-pointed. A Tridentate leaf is shown at Fig. 101.

TRIDENTEA. Included under **Stapelia** (which *see*).

TRIDIA. Included under **Hypericum** (which *see*).

TRIENTALIS (a Latin term, signifying one-third of a foot in height; in reference to the stature of the plants). Chickweed Wintergreen. ORD. *Primulaceæ*. A small genus (two species) of highly glabrous, hardy herbs, with creeping, perennial rhizomes; one is found in Europe, North Asia, and North-west America. Flowers white; calyx five to nine-parted, persistent; corolla hypogynous, rotate, five to nine-parted, the tube very short, the segments elliptic-lanceolate; stamens five to nine; peduncles one to three, one-flowered, filiform, ebracteate. Leaves usually as many as the petals, somewhat whorled, obovate-elliptic or lanceolate, entire. Stems solitary, slender, erect. These pretty little plants require a light, rich soil and a shady situation. Propagated, in spring, by seeds, covered with a handlight; or by divisions.

T. americana (American). Star Flower. *fl.*, divisions of the corolla finely acuminate. May. *l.* lanceolate, acuminate at both ends. Stem very naked below, unequally five to nine-leaved at the summit, 9in. high. North-west America, 1816.

FIG. 102. TRIENTALIS EUROPÆA, showing Habit and detached Flower.

T. europæa (European). *fl.* few, erect; corolla ¼in. to ⅜in. in diameter, the lobes ovate, acute. June and July. *l.* obovate or obovate-lanceolate, 1½in. to 2½in. long, shining, rigid, obtuse or acute, narrowed into short petioles. Stem wiry, slender, leafy at top, 4in. to 8in. high. Europe (Britain), &c. See Fig. 102. (L. B. C. 105; Sy. En. B. 1139.)

TRIFARIOUS. Arranged in a triple rank, or in three rows.

TRIFID. Split half-way into three parts.

TRIFOLIOLATE. Bearing three leaflets from the same point; *e.g.*, Clover.

TRIFOLIUM (from *tres*, three, and *folium*, a leaf; most of the species have trifoliolate leaves). Clover; Trefoil. Including *Lupinaster* and *Pentaphyllon*. ORD. *Leguminosæ*. A large genus (nearly 280 species have been described, of which, probably, not more than 150 are really distinct) of hardy, annual or perennial herbs, copiously dispersed over the temperate and sub-tropical regions of the Northern hemisphere, a few being also found in the mountains of tropical America, Africa, and extra-tropical South America. Flowers often purple, red, or white, rarely yellow, spicate, capitate, umbellate, or rarely solitary; calyx teeth or lobes sub-equal, or the

Trifolium—*continued.*

lower ones longer; petals often marcescent, all long-clawed, or the four lower ones more or less adnate with the staminal tube; standard oblong or ovate; wings narrow; keel shorter than the wings, obtuse; stamens diadelphous. Pod oblong and sub-terete, or obovate-compressed, indehiscent. Leaves digitately three, rarely five or seven, foliolate, sometimes pinnately three or very rarely five-foliolate; stipules adnate with the petioles. This genus embraces several important fodder-plants. Eighteen species are included within the British Flora, viz., *T. arvense* (Hare's-foot Clover), *T. Bocconi*, *T. filiforme* (Yellow Suckling Clover), *T. fragiferum* (Strawberry Clover), *T. glomeratum*, *T. incarnatum* (Crimson or Carnation Clover), *T. maritimum*, *T. medium* (Cow Grass; Meadow or Zigzag Clover), *T. minus*, *T. ochroleucum*, *T. pratense* (Red or Broad-leaved Clover; Marl-grass), *T. procumbens* (Hop Trefoil), *T. repens* (White or Dutch Clover; Shamrock), *T. scabrum*, *T. striatum* (Knotted Clover), *T. strictum*, *T. subterraneum*, and *T. suffocatum* (Sand Clover); and *T. hybridum* (Alsike or Bastard Clover) has become naturalised. Four-leaved Shamrocks and other Clovers are considered "lucky," as being rare, but are by no means unfrequently met with. Few of the species of *Trifolium* boast of much horticultural merit; the selection given below embraces all that call for description here. All thrive in common garden soil. The annuals and biennials may be increased by seeds, and the perennials by divisions. Except where otherwise stated, the under-mentioned plants are perennials.

T. alpestre (alpine).* Owl-headed Clover. *fl.* purple; lower calyx segment longer than the gamopetalous corolla, the rest short and tooth-like; heads globose. June and July. *l.*, leaflets lanceolate, coriaceous, ciliately serrulated; stipules narrow, nearly sessile, long. Stem erect, simple. *h.* 6in. to 12in. Alps of Europe and Western Asia, 1789. (B. M. 2779.)

T. cæruleum (blue). A synonym of *Trigonella cærulea*.

T. canescens (hoary). *fl.* cream-coloured; calyx smooth, the lowest segment a little longer than the rest; corolla gamopetalous, much longer than the calyx segments; heads terminal, large, oblong, nearly sessile. May and June. *l.*, leaflets obovate, emarginate, villous; stipules lanceolate-subulate. Stems ascending, adpressedly hairy. Cappadocia, &c., 1803. (B. M. 1168.)

T. fimbriatum (fringed). *fl.* purple; calyx teeth spiny, half as long as the slender corolla; heads 1in. in diameter. September and October. *l.*, leaflets oblong or slightly cuneate, 1in. or more in length, conspicuously fringed with spinulose-setaceous teeth. Stems long and thick, prostrate, glabrous. North America, 1825. (B. R. 1070; L. B. C. 1421.)

T. fucatum (painted). *fl.* cream-colour mixed with red; corolla many times longer than the calyx; heads 1in. to 2in. in diameter, somewhat hemispherical, few-flowered; peduncles axillary, mostly longer than the leaves. June. *l.*, leaflets roundish-cuneiform, sharply denticulate, rather thick; stipules large, entire, mucronate. *h.* 6in. California, 1824. Annual. (B. R. 1883.)

T. hybridum (hybrid). Alsike or Bastard Clover. *fl.* white or rosy, ⅛in. long, drooping; heads axillary, peduncled, globose, ⅜in. to 1in. in diameter. June to August. *l.* on long petioles; leaflets obovate or oblong, ½in. to 1½in. long, toothed; stipules oblong, with triangular tips. Stems 2in. to 10in. long, flexuous. Europe, &c. (B. M. 3702.)

T. incarnatum (flesh-coloured). Crimson Clover. *fl.* bright scarlet, ½in. long; calyx hairy; heads peduncled, terminal, ovoid or cylindric, 1in. to 2in. in diameter. June and July. *l.* on short petioles; leaflets broadly obovate or obcordate, ⅜in. to 1½in. long; stipules obtuse. Stems rather slender, clothed with spreading hairs. *h.* 1ft. South Europe, 1640. Annual. (B. M. 328.)

T. Lupinaster (Lupinaster).* Bastard Lupine. *fl.* purple, large, the wings and keel paler than the standard; heads pedunculate, bractless, umbellate. June to August. *l.* sessile; leaflets five, linear-lanceolate, sharply toothed, mucronate; stipules broad, acuminate. *h.* 1ft. to 1½ft. Siberia, 1741. (B. M. 879.) *albiflorum* is a white-flowered form.

T. olympicum (Olympic). *fl.* yellowish; calyx hairy; standard very long; spikes oblong, solitary. July. *l.*, leaflets hairy, elliptic-lanceolate, entire; stipules subulate, sheathing. Stem erect, hairy. *h.* 1ft. Mount Olympus, 1817. (B. M. 2790.)

T. reflexum (reflexed). Buffalo Clover. *fl.* handsome; standard rose-red, broadly ovate; wings and keel white; heads sub-umbellate, dense; peduncles about twice the length of the heads. April to June. *l.*, leaflets obovate or obovate-oblong,

Trifolium—*continued.*

sometimes emarginate, crenulate-serrulate; stipules leafy, acuminate. Stem ascending or decumbent, 1ft. to 1½ft. long North America, 1794. Annual. (B. M. 3471.)

T. rubens (reddish). *fl.* carmine or purple-red; heads peduncled, ovoid, large. Summer. *l.* stalked; leaflets long, narrow; stipules large. Stems erect. *h.* 1ft. Central and South Europe. (R. G. 1886, p. 243.)

T. spadiceum (chestnut-brown). Brown Clover. *fl.* yellow; standard slightly ferruginous, obcordate; heads ovoid, pedunculate. June to August. *l.* stalked; leaflets oblong-ovate, sessile, denticulated; stipules leafy, acuminate. Stem erect, 6in. high. Europe, 1778. (B. M. 557.)

T. uniflorum (one-flowered).* *fl.* axillary, solitary, on short peduncles; corolla very long, the standard blue, the wings and keel purple. May to September. *l.*, leaflets three, ovate, acuminate, toothed, nerved; stipules sheathing, long-acuminate. Stems very short. Syria, &c., 1800. Plant tufted, creeping. (L. B. C. 1882; S. B. F. G. ser. ii. 200.) The form *Sternbergianum* has white flowers.

T. vesiculosum (bladdery-calyxed). *fl.*, reddish; calyx scarious, inflated, the segments subulate, much shorter than the corolla; heads ovate, thick, on long peduncles. June and July. *l.*, leaflets lanceolate, acute, sharply serrulated; stipules narrow, long-acuminate. Stems erect, firm, 9in. high. South Europe, 1805. (B. R. 1408.)

TRIFURCIA (from *tres*, three, and *furca*, a fork; alluding to the three-forked style). The correct name, according to Bentham and Hooker, is *Alophia*. SYN. *Herbertia*. ORD. *Irideæ*. A small genus (three or four species) of pretty, American, stove, greenhouse, or hardy, bulbous plants. Flowers long-pedicellate; perianth tube none; segments free, the three outer ones shortly unguiculate, spreading, obovate or broadly oblong, the three inner ones much smaller, acute, erect or scarcely spreading; filaments connate in a cylindrical tube; spathes narrow. Leaves few. Bulb tunicated. Only two species call for description here. They thrive in a mixture of equal parts loam, peat, and sand. With protection in winter, the plants will succeed in the open border. Propagation may be effected by offsets, or by seeds.

T. cærulea (blue). *fl.*, outer perianth segments having a white claw, dotted with blue, the blade blue, with a deeper-coloured, triangular mark at base; inner segments blue, deeper-coloured in the middle; anthers and stigma short; peduncle shorter than the bracts. April. Texas, 1842. Half-hardy. SYN. *Herbertia cærulea* (B. M. 3862, figs. 3, d, e, f).

T. pulchella (pretty). *fl.*, limb of the outer perianth segments lilac, undulated, the claw pale-yellowish or whitish, dotted with purple; inner segments deeper-coloured in the middle; anthers subulate, exceeding the stigma. July. *l.* 5in. or more long. Buenos Ayres, 1827. Greenhouse. SYN. *Herbertia pulchella* (B. M. 3862, figs. 1, 2; L. B. C. 1547; S. B. F. G. 222).

TRIGLOCHIN (from *treis*, three, and *glochin*, a point; in reference to the three angles of the carpel). Arrow Grass. ORD. *Naiadaceæ*. A genus consisting of about a dozen species of greenhouse or hardy, marsh-loving, erect, scape-bearing herbs, broadly dispersed over mostly temperate and frigid regions. Flowers small or rather large, spicate or shortly pedicellate and racemose, erect, ebracteate and ebracteolate; perianth segments scale-like, three, six, or rarely fewer; stamens six. Leaves elongated, flat or somewhat terete, sometimes swimming. Two species—*T. maritimum* and *T. palustre*—are British plants. *T. bulbosum* is the only one calling for description here. It thrives in pots of loamy soil, the bottoms of which are immersed in water.

T. Barrelieri (Barrelier's). A synonym of *T. bulbosum*.

T. bulbosum (bulbous-rooted). *fl.* purplish, numerous and very variable, pedicellate, disposed in a simple, elongated raceme; scape erect, smooth. October. *l.* semi-cylindric, linear, bilobed, complanate or scarcely channelled above, the outer ones often reduced to sheaths. Rhizome short, more or less tuberous. *h.* 1ft. Europe, Asia Minor, and South Africa, 1806. Greenhouse. (B. M. 1445; L. B. C. 1151.) SYN. *T. Barrelieri*.

TRIGLOSSUM. A synonym of **Arundinaria** (which *see*).

TRIGONAL. Three-angled, and having three plain faces.

TRIGONELLA (from *treis*, three, and *gonu*, an angle; the standard of the flower is flat, while the wings spread, thus imparting a triangular appearance). Fenugreek. Including *Pocockia*. ORD. *Leguminosæ*. A genus comprising nearly fifty species of hardy, often strong-smelling, annual or perennial herbs; one is Australian, and the rest are dispersed over Europe, Asia, and Africa. Flowers yellow, blue, or white, variously disposed; calyx tubular or short, with sub-equal teeth or lobes; petals free of the staminal tube; standard obovate or oblong, sessile or contracted into a broad claw; wings oblong; keel obtuse. Leaves pinnately trifoliolate; stipules adnate with the petioles. Scarcely any of the species are worth growing. The seeds of *T. Fœnum-Græcum* were anciently held in great repute for medicinal and culinary purposes; but their use in medicine is with us confined to veterinary practice. The genus is represented in Britain by *T. ornithopodioides*. Sowing in the open border is all that is required by the under-mentioned species.

T. cærulea (blue). *fl.* in dense, pedunculate heads; petals white, lined with blue. July and August. *l.*, leaflets ovate, the lower ones roundish-ovate, denticulated; stipules lanceolate, toothed at base. Stems erect, 1ft. to 2ft. high. Bohemia and Switzerland, 1562. Annual. SYN. *Trifolium cæruleum* (B. M. 2283).

T. Fœnum-Græcum. Fenugreek. *fl.* white; calyx pilose, the subulate teeth as long as the tube. June to August. *l.*, leaflets obovate, obsoletely toothed; stipules lanceolate-falcate, entire. Stem erect, simple, 1ft. to 2ft. high. South of France, 1597. Annual. (B. M. Pl. 71; S. F. G. 766.)

T. ruthenica (Russian). *fl.* yellow, disposed in racemose heads. June and July. *l.* lanceolate, very obtuse, sharply serrulated; stipules nearly entire. Stems prostrate, ascending, 1½ft. long. Siberia, 1759. Perennial. (L. B. C. 1391.)

TRIGONIA (from *treis*, three, and *gonu*, an angle the fruit is triangular). SYN. *Mainea*. ORD. *Vochysiaceæ*. A genus embracing about twenty-five species of climbing or sarmentose, stove shrubs, natives of Brazil and Guiana. Flowers often small, in terminal panicles or racemes; sepals and petals five each; stamens five to twelve. Leaves opposite, on short petioles; stipules caducous. Three species have been introduced, but are now probably lost to cultivation.

TRIGONIDIUM (from *trigona*, a triangle, and *eidos*, like; alluding to the triangular form of several parts of the plants). ORD. *Orchideæ*. A small genus (seven or eight species have been described) of curious, stove, epiphytal Orchids, inhabiting tropical America. Flowers rather large, shortly pedicellate within spathaceous bracts; sepals sub-equal, connivent or coherent at base in a triquetrous, turbinate tube, free above, spreading; petals similar, but much smaller; lip rising from the base of the column, erect, much shorter than the sepals, the lateral lobes erect, embracing the column, the middle one spreading; pollen masses four; scapes many-sheathed, one-flowered. Stem very short, mostly pseudo-bulbous. A selection of the species known in gardens is given below. They thrive on blocks, or in baskets of peat, fibre, and sphagnum, and like a fairly light position, near the glass.

T. acuminatum (taper-pointed). *fl.* dull straw-colour externally, within elegantly pencilled with rich brown; sepals acuminate, recurved at apex; petals oval-lanceolate, mucronate. *l.* linear, longer than the peduncles. Pseudo-bulbs ovate, acute, sulcate, one-leaved. Demerara, 1834.

T. Egertonianum (Sir P. Egerton's). *fl.* pale liver-colour, dashed and veined with brown; sepals acute, the lateral ones reflexed; petals slightly acute. *l.* narrow, often 1½ft. long, ensiform. Pseudo-bulbs clustered, oval, compressed, two-leaved. Honduras, 1834. A very distinct species.

T. obtusum (obtuse).* *fl.*, sepals reddish-yellow, obovate; petals white, veined with rose, brown at apex, obtuse; lip white, tubercled at back, the lateral lobes red-margined, the middle one yellow in front. *l.* linear-lanceolate. Demerara, 1834. (B. R. 1923.)

T. tenue (slender). *fl.* brownish-purple; sepals reflexed, very acuminate; lip obtuse, glabrous, reflexed at apex; scape erect, slender. *l.* ensiform, very acute, longer than the scape. Pseudo-bulbs oval, compressed, one-leaved. Demerara, 1836.

TRIGONOTHECA. A synonym of **Catha** (which *see*).

TRIGUERA. Included under *Hibiscus.*

TRIGYNOUS. Having three styles.

TRILISA (from *trilix*, triple; in allusion to the divisions of the pappus). ORD. *Compositæ.* A small genus (two species) of hardy, erect, perennial herbs, natives of North America. Flower-heads purplish or white, rather small, paniculate; florets equal, regular, tubular, five-cleft; involucral bracts in two or three series; receptacle flat, naked. Leaves alternate, entire, amplexicaul; radical ones elongated. Only one species calls for description here. It thrives in any moderately good, light soil. Propagation may be effected by divisions, in spring; or by seeds, which are usually sown early in autumn.

T. odoratissima (very odorous). Vanilla Plant. *fl.-heads* bright purple, numerous, pedicellate; involucral scales glandular. September. *l.* thick; radical ones large, obovate-spathulate, tapering at base, often slightly and obtusely toothed; cauline ones oblong, clasping at base, the upper ones small and scattered. Stem 2ft. to 4ft. high, corymbose at top. 1786. The leaves, when bruised, exhale the odour of vanilla. SYN. *Liatris odoratissima* (A. B. R. 633; S. B. F. G. ser. ii. 184).

TRILIX. A synonym of **Prockia** (which *see*).

TRILLIACEÆ. Included under *Liliaceæ.*

TRILLIUM (from *trilix*, triple; alluding to the triple parts of the flowers and leaves). American Wood Lily; Indian Shamrock; Three-leaved Nightshade. ORD. *Liliaceæ.* A genus comprising about a dozen species of hardy, perennial herbs, with short, thick rhizomes, natives of North America and extra-tropical Asia, from the Himalayas, as far as Japan. Flowers solitary, erect, drooping or reflexed, sessile or pedicellate within the leaves; perianth violet, lurid, white, or greenish, persistent; segments distinct, spreading, the three outer ones slender and herbaceous, green or rarely coloured, the three inner ones petaloid, often larger, less spreading, or sometimes recurved; stamens six; style deeply trifid, or three-parted from the base. Berry globose or ovoid, indehiscent. Leaves three, whorled at the apex of the stem, broad, sub-sessile or rather long-petiolate, three to five-nerved and reticulate-penniveined. Stem simple, erect, with a few short, scarious sheaths at base. The species best known to cultivation are here described. All are North American, and have violently emetic roots. A deep, well-drained bed of peaty soil, in a somewhat shady position, is the most suitable for these plants. During summer, a plentiful supply of water is essential. They may be increased, rather slowly, by dividing the roots, or by seeds. *T. grandiflorum* is the best species, and is one of the most desirable hardy plants for all collections.

T. Catesbæi (Catesby's). A synonym of *T. stylosum.*

T. cernuum (drooping). *fl.* small; inner perianth segments white, eight to twelve lines long, oblong-ovate, wavy, recurved, rather longer than the lanceolate outer ones; peduncle usually shorter than the flower. April and May. *l.* broadly rhomboidal, 2in. to 6in. long, abruptly acuminate, shortly petiolate. Stems two or three together, 1½ft. high. 1758. (B. M. 954.)

T. discolor (two-coloured). *fl.*, inner perianth segments dark purple, varying into green, 1½in. to 2in. long, erect, oblong, obtuse, narrowed below; outer ones shorter, lanceolate, spreading. February and March. *l.* sessile, 3in. to 5in. long, ovate-lanceolate to broadly ovate, tapering from near the base to the apex, variegated above with green and brown, or dark purple. Stem stout, solitary, 6in. to 12in. high. 1831. (B. M. 3097.) According to Sereno Watson, the correct name of this plant is *T. sessile Wrayi.*

T. erectum (erect).* Beth-root; Birth-root; Lamb's Quarters. *fl.* 1in. to 1½in. long, spreading, fetid; inner perianth segments dark purple, oval or oblong, rather longer than the lanceolate-ovate outer ones; peduncles 1½in. to 3in. long, at length declined. May. *l.* sessile, broadly rhomboidal, abruptly acuminate, acute at base. Stem solitary, 1ft. high. 1759. See Fig. 103. (B. M. 470; F. d. S. 990; L. B. C. 1838.) SYNS. *T. fœtidum* (G. C. n. s., xix., p. 605), *T. pendulum* (R. G. 656), *T. rhomboideum* (B. 138).

Trillium—*continued.*

T. e. album (white). *fl.*, inner perianth segments greenish-white, or rarely yellowish. (B. M. 1027; L. B. C. 1850.)

T. e. ochroleucum (yellowish-white). *fl.*, inner perianth segments yellowish-white. (B. M. 3250, under name of *T. e. viridiflorum.*)

T. erythrocarpum (red-fruited).* Painted Wood Lily. *fl.* ⅔in. to 1in. long; inner perianth segments white, striped with purple at the base, oblong, wavy, much longer than the lanceolate outer ones; peduncle 1in. to 2in. long, erect. April and May. *fr.* red. *l.* ovate, 3in. to 5in. long, long-acuminate, rounded at base, shortly petiolate. Stem solitary, 1ft. high. 1811. (B. M. 3002; L. B. C. 1232; S. B. F. G. 212.)

T. fœtidum (fetid). A synonym of *T. erectum.*

T. grandiflorum (large-flowered).* Wake Robin. *fl.* 2in. long; inner perianth segments white, changing to rose-colour, obovate, much longer and broader than the lanceolate outer ones; peduncle longer than the flower, erect or slightly declined. May. *l.* 3in. to 5in. long, rhombic-ovate, abruptly acuminate, nearly sessile. Stem solitary, 1ft. to 1½ft. high. 1799. A fine plant. (F. d. S. 991; L. B. C. 1349; R. G. 575; B. M. 855, under name of *T. erythrocarpum.*)

T. nervosum (nerved). A synonym of *T. stylosum.*

T. nivale (snowy).* *fl.*, inner perianth segments, white, oblong, obtuse, 1in. long, scarcely wavy, spreading from an erect base, equalling the peduncle; outer ones lanceolate, obtuse. April. *l.* 1in. to 2in. long, oval or ovate, obtuse, rounded at base, distinctly petiolate. Stem 2ft. to 4ft. high. 1879. (B. M. 6449.)

FIG. 103. TRILLIUM ERECTUM.

T. obovatum (obovate). *fl.*, inner perianth segments pink, above 1in. long, elliptic-ovate, obtuse; inner ones shorter, oblong; peduncle erect, 1in. long. April. *l.* sessile, roundish-rhomboid, abruptly acuminate, green above, scarcely paler beneath, glabrous, 2½in. long. Stem erect, 8in. to 10in. high. 1810. This is regarded by Sereno Watson as probably identical with *T. erectum.*

T. pendulum (pendulous). A synonym of *T. erectum.*

T. rhomboideum (rhomboid). A synonym of *T. erectum.*

T. sessile (sessile). *fl.* ten to fifteen lines long, sessile, erect; inner perianth segments dark purple, lanceolate, erect, much longer than the lanceolate, spreading sepals. March and April. *l.* sessile, 1in. to 3in. long, broadly oval, widest in the middle, abruptly pointed, narrowed at base, variegated above with paler and deeper green. Stems slender, 6in. to 12in. high, commonly two or more in a cluster. 1759. (B. M. 40; F. d. S. 2311; L. B. C. 875.)

T. s. Wrayi. *See* **T. discolor.**

T. stylosum (large-styled). *fl.* 1½in. to 2in. long; inner perianth segments tinged with rose-colour, oblong, much longer and broader than the sepals; styles united below the middle; peduncle 1½in. to 2in. long. April and May. *l.* oval or oblong, 4in. long, acute, shortly petiolate. Stem solitary, slender, 1ft. to 1½ft. high. 1823. SYNS. *T. Catesbæi*, *T. nervosum.*

TRILOBATE. Three-lobed. A Trilobate leaf, with ciliated margins, is shown at Fig. 104.

FIG. 104. TRILOBATE LEAF, WITH CILIATED MARGINS.

TRILOCULAR. Three-celled.

TRIMERISMA. A synonym of **Platylophus** (which *see*).

TRIMESTRIS. Existing for three months.

TRIMEZIA (from *treis*, three, and *merizo*, to divide; in allusion to the trimerous division of the flower). SYNS. *Lansbergia, Poarchon, Remaclea, Xanthocromyon.* ORD. *Irideæ.* A genus embracing about half-a-dozen species of stove, bulbous plants, natives of the West Indies and South America. Flowers many in a spathe, pedicellate; perianth tube none, the segments free, shortly unguiculate; stamens opposite the outer perianth segments; spathe solitary, terminal, or two or three at the axils of the floral leaves. Leaves few at the base of the stem, long, flat, and prominently ribbed, sometimes terete and Rush-like; floral one solitary, or the stem wholly leafless. Only one species has been introduced. For culture, *see* **Iris.**

T. martinicensis (Martinique). *fl.* four to six in a cluster; perianth segments bright yellow, very fugacious, the three outer ones ⅝in. to ¾in. long, mottled at the throat, the three inner much smaller; scape equalling the leaves, with a single, reduced, clasping leaf. April. *l.*, radical ones about six, erect, narrow-linear, 1ft. long, three to four lines broad, gradually narrowed to a point. West Indies, &c., 1848. SYNS. *Cipura martinicensis* (Ref. B. 310), *Iris martinicensis* (B. M. 416), *Lansbergia caracasana.*

TRINIA (named in honour of Dr. Karl B. Trinius, 1778-1844, a Russian botanist). ORD. *Umbelliferæ.* A genus embracing seven or eight species of hardy, much-branched, perennial herbs, inhabiting the Mediterranean region and temperate Asia, one—*T. vulgaris*—being a native of Britain. Flowers yellowish or white, in compound, often few-rayed umbels. Leaves pinnately or subternately decompound. The species are of no interest from a garden standpoint.

TRINODAL. Having only three nodes.

TRIODIA (from *treis*, three, and *odous*, teeth; referring to the three-toothed glumes). SYN. *Uralepis* (erroneously spelt *Uralepsis*). Including *Tricuspis* and *Tridens.* ORD. *Gramineæ.* A genus comprising upwards of twenty species of greenhouse or hardy, perennial Grasses, natives of Europe, extra-tropical America, South and sub-tropical Africa, Australia, and New Zealand, a few being also found in tropical America. Spikelets many-flowered, usually erect; glumes rather rigid, one to three-nerved, the two lower ones empty; panicle terminal, narrow or ample. Leaves narrow. *T. decumbens* (Heath Grass) is a native of Britain. Several species have been introduced, but they have no value from a garden standpoint.

TRIŒCIOUS, TRIOICUS. Having male flowers on one individual, females on another, and hermaphrodite on a third.

TRIOLENA (from *treis*, three, and *olene*, the arm; alluding to the three processes from the base of the anthers). ORD. *Melastomaceæ.* A small genus (three species) of nearly glabrous, pilose or paleaceous, stove herbs, natives of Mexico, Venezuela, and New Grenada. Flowers disposed in scorpioid racemes or spikes; calyx tube short, at length three-winged, the lobes five; petals five, obovate; stamens ten, sub-equal; anthers dissimilar. Leaves ample, petiolate, ovate or oblong. *T. scorpioides*, a perennial with the habit of *Bertolonia*, is the only species

Triolena—*continued.*

introduced. It requires a compost of rich, sandy loam and leaf mould, and a moist heat. Propagated by seeds; or by cuttings, inserted in sandy loam, under a bell glass, in bottom heat.

T. scorpioides (scorpioid-flowered). *fl.* disposed in scorpioid racemes at the tips of axillary peduncles; petals oblong-obovate. *l.* somewhat acuminate, lightly serrulated. Stem 1in. or rather more in length, somewhat woody. *h.* 6in. Chiapas, 1859.

TRIONUM. Included under **Hibiscus** (which *see*).

TRIOPTERYS (from *treis*, three, and *pteron*, a wing; the samaras are three-winged). ORD. *Malpighiaceæ.* A small genus (three species) of stove, climbing shrubs, inhabiting the West Indies and Mexico. Flowers blue or violet; calyx five-parted, with eight glands; petals clawed; stamens ten, all perfect, the alternate ones longer; racemes or panicles axillary and terminal; peduncles bracteate and bibracteolate at base. Leaves opposite, highly glabrous, lucid, veined, petiolate, without glands or stipules. It is doubtful whether the plants here described are still in cultivation, as they are very shy flowerers in this country. A compost of peat and sand is best suited to their requirements. Propagation may be effected by ripened cuttings, inserted in sand, under a hand glass, in heat.

T. rigida (rigid). *fl.* blue; racemes distant, forming a loose panicle. May. *l.* rigid, coriaceous, orbicular-obovate, elliptic, or oblong-linear, shining, with many parallel and anastomosing veins. West Indies, 1822.

T. r. jamaicensis (Jamaica). *l.* ½in. to 1in. long, ¼in. to ½in. broad.

T. r. lucida (clear). *l.* retuse or blunt, 1½in. long, eight to sixteen lines broad.

TRIOSTEUM (from *treis*, three, and *osteon*, a bone; alluding to the three bony seeds, or rather nutlets). Feverwort; Horse Gentian. ORD. *Caprifoliaceæ.* A genus comprising three species of hardy, perennial herbs; one is Himalayan and the others are North American. Flowers dirty white, yellow, or purple, often axillary, solitary or clustered, rarely spicate; calyx tube ovoid, the limb of five persistent lobes; corolla tubular-campanulate, the tube gibbous at base; limb oblique, with unequal, imbricated lobes; stamens five. Drupe two to (rarely) five or six-stoned. Leaves opposite, slightly connate at base, sessile, somewhat panduriform or obovate, entire. *T. perfoliatum*, the best-known species, thrives in a light, sandy soil with a little leaf mould. It may be multiplied by divisions of the plant, in spring; or by cuttings of the young shoots, inserted under a handlight, in the beginning of summer.

T. perfoliatum (perfoliate-leaved). *fl.* brownish-purple, mostly clustered, sessile. June. *fr.* orange-colour, ½in. long. *l.* oval, abruptly narrowed below, downy beneath. *h.* 2ft. to 4ft. North America, 1730. Plant softly hairy. (S. B. F. G. ser. ii. 45.)

TRIPARTED, TRIPARTITE. Parted to the base in three divisions.

TRIPETALEIA. A synonym of **Elliottia** (which *see*).

TRIPETELUS. A synonym of **Sambucus** (which *see*).

TRIPHÆNA. *See* **Tryphæna.**

TRIPHASIA (from *triphasios*, triple; alluding to the number of sepals and petals). ORD. *Rutaceæ.* A monotypic genus. The species is a greenhouse, evergreen, spiny shrub. Its fruits, when ripe, have an agreeable, sweet taste; they are sometimes preserved whole in syrup, and are occasionally sent to this country from Manilla as Lime berries. The plant succeeds in a compost of turfy loam and peat, and requires careful watering in winter. Propagation may be effected by cuttings, inserted in sand, under a glass, in heat.

T. trifoliata (three-leaved). Lime-berry Tree of Manilla. *fl.* white, sweet-scented, solitary, axillary; calyx three-lobed; petals three, free, imbricated; stamens six, free, sub-equal.

Triphasia—*continued.*

FIG. 105. FRUITING BRANCH OF TRIPHASIA TRIFOLIATA.

May to July. *fr.* red-bay colour, ovoid, as large as a hazel nut, by abortion one or two-celled, one or two-seeded. *l.* alternate, trifoliolate; leaflets ovate, obtuse, often crenate, the lateral ones smaller. *h.* 5ft. China (and broadly cultivated), 1798. See Fig. 105.

TRIPHORA. Included under **Pogonia** (which *see*).

TRIPHYSARIA (from *treis*, three, and *physa*, a bladder; alluding to the three saccate segments of the lower lip of the corolla). SYN. *Oncorrhynchus.* ORD. *Scrophularineæ.* A genus comprising about twenty-three species of hardy, annual, North American herbs, now regarded, by Bentham and Hooker, as synonymous with *Orthocarpus.* Flowers yellow or purplish, solitary in the axils of the bracts, disposed in terminal spikes; corolla with a conspicuously trisaccate lip very much larger than the slender, straight galea. Leaves alternate or nearly opposite. *T. versicolor*, the only species introduced, requires ordinary treatment.

T. versicolor (various-coloured). *fl.* cream-coloured, changing to rose-purple; lip of the corolla not more than a quarter the length of the densely pubescent tube. June. *l.* incised at apex; segments few, linear-setaceous. *h.* 9in. or more. 1837. Plant fastigiately much-branched. The proper name of this annual is *Orthocarpus erianthus roseus.*

TRIPINNATE. When the leaflets of a bipinnate leaf are themselves pinnate.

TRIPLADENIA. A synonym of **Kreysigia** (which *see*).

TRIPLARIS (from *triplex*, triple; the parts of the fructification are disposed in threes). SYN. *Velasquezia.* ORD. *Polygonaceæ.* A genus comprising not more than ten distinct species of stove trees, broadly dispersed over tropical South America. Flowers dicœcious, sessile or nearly so within the bracts, disposed in long, softly or silky-pilose, simple or often branched spikes; perianth six-cleft, the male funnel-shaped, the female narrow. Nut prominently and rather acutely trigonal. Leaves alternate, shortly petiolate, often ample, ovate, oblong, or lanceolate. *T. americana* has been introduced, but it is a doubtful species, and is probably lost to cultivation.

TRIPLE-NERVED, TRIPLE-RIBBED. When of three ribs the two lateral ones emerge from the middle one a little above its base.

TRIPLET LILY. *See* **Triteleia.**

TRIPLEURA. A synonym of **Zeuxina** (which *see*)

TRIPLO. Thrice.

TRIPOLIUM. Included under *Aster.*

TRIPOLY. *See* **Aster Tripolium.**

TRIPSACUM (from *tribo*, *tripeo*, to thresh; alluding to the purpose to which the grain may be applied). ORD. *Gramineæ.* A genus consisting of two species of rather tall, greenhouse or hardy Grasses, inhabiting America, from Mexico to Texas. Spikelets unisexual, monœcious, often two or three, rarely four, many or only one at the tips of the spike, the upper part of which is male, the lower female; glumes four; peduncles solitary or twin in the upper axils. Leaves long, subulate-acuminate. The species are valuable fodder-plants in their native places, but are too tender for our climate.

TRIPTEROSPERMUM. A synonym of **Crawfurdia** (which *see*).

TRIPTERYGIUM (from *treis*, three, and *pterygion*, a small wing; referring to the fruit). ORD. *Celastrineæ.* A monotypic genus. The species is a highly glabrous, hardy, sub-scandent shrub. For culture, *see* **Celastrus.**

T. Wilfordii (Wilford's). *fl.* white, small; calyx five-lobed; petals five, inserted at the base of the disk; stamens five, on the margin of the disk, the filaments subulate; disk broadly cup-shaped; racemes short, axillary and terminal. June. *fr.* ¼in. long, dry, indehiscent, three-winged, one-seeded. *l.* alternate, petiolate, ovate-oblong, attenuated at apex, serrated, thickly veined, exstipulate. *h.* 2ft. to 3ft. Japan, Formosa, and Corea, 1867. (R. G. 612.)

TRIPTILION (from *treis*, three, and *ptilon*, a wing; alluding to the three divisions of the pappus). ORD. *Compositæ.* A genus embracing about half-a-dozen species of hardy or half-hardy, annual or perennial, Chilian herbs. Flower-heads blue or white, rather small, homogamous, forming a leafy panicle or corymb at the tips of the branches; florets bilabiate, the outer lip entire or three-toothed, the inner entire or bifid; involucral bracts few, very acute and spinescent, the outer ones shorter; receptacle naked or bristly-fimbrilliferous; achenes minutely papillose. Leaves alternate, scattered, ciliated- or spiny-toothed or pinnatifid. Two species have been introduced. Seeds should be sown, on a slight hotbed, in the beginning of April. The seedlings may be pricked out, and either planted out in a sheltered place, at the end of May, or flowered in pots, in a cool, airy greenhouse. A rich, light soil is necessary. *T. spinosum* may also be increased by divisions.

T. cordifolium (cordate-leaved). *fl.-heads* white, sub-ternately clustered at the tips of the branches and branchlets; pappus bristles three, ciliated at apex. July. *l.* sessile, cordate-amplexicaul, nearly round, the margins toothed and furnished with distant spines. Stem erect, branched at apex. *h.* 6in. 1824. Annual. (B. R. 853.)

T. spinosum (spiny). *fl.-heads*, outer lips of the florets blue, inner white; involucre glabrous. July. *l.* pinnately lobed; lobes terminated by a spiny mucrone. Stem corymbose at apex. *h.* 6in. 1827. Perennial. (B. 224; B. R. xxvii. 22; P. M. B. x. 269.)

TRIQUETROUS. Three-edged; three-cornered.

TRISECTED. Cut into three parts.

TRISETUM (from *treis*, three, and *seta*, a bristle; alluding to the three awns of the flower). Including *Rostraria* and *Trichæte.* ORD. *Gramineæ.* A genus embracing nearly fifty species of hardy, perennial or rarely annual, tufted Grasses, broadly distributed over temperate and mountainous regions. Spikelets two (rarely three to six) flowered, often shining; glumes membranous, sub-scarious, or the flowering ones hyaline, the two lower ones empty; panicles sometimes densely spike-formed,

Trisetum—*continued.*

ovate or oblong, sometimes lax and effuse. Leaves flat. *T. flavescens*, the British representative of the genus, is particularly useful for agricultural purposes. None of the species possess any horticultural interest.

TRISIOLA. A synonym of **Uniola.**

TRISMERIA. Included under *Gymnogramme.*

TRISTAGMA (from *treis*, three, and *stagma*, a drop; in reference to the three honey-glands). SYNS. *Stemmatium, Stephania* (of Willdenow), *Stephanolirion.* ORD. *Liliaceæ.* A genus comprising only three species of greenhouse, bulbous plants, natives of Chili. Flowers not numerous, in terminal umbels, pedicellate; perianth salver-shaped, with a cylindrical tube, and six sub-equal, spreading lobes; corona of three to six sub-connate or free scales, or wholly deficient; stamens six; involucral bracts two; scape simple, leafless. Leaves radical, few, narrow-linear. Corm sub-globose, tunicated. *T. narcissoide*, the only species introduced, is a pretty and interesting plant, somewhat resembling a Narcissus. It thrives in a compost of rich, sandy loam, and does not require much water. Propagation may be effected by seeds, or by offsets.

T. narcissoide (Narcissus-like). *fl.*, perianth tube dirty white, scarcely ½in. long, with six green bands; segments pure white on the face, with a slender, two-nerved, greenish keel; corona bright orange, erect; umbel five or six-flowered; scape slender, terete, purple, above 1ft. long. September. *l.* about four, erect, 6in. high, narrow-linear, glabrous, acuminate. Bulb globose, less than 1in. thick, with several brown, membranous tunics. 1875. SYNS. *Stemmatium narcissoides, Stephanolirion narcissoides.*

TRISTANIA (named in honour of Jules M. C. Tristan, 1776-1861, a French botanist). ORD. *Myrtaceæ.* This genus embraces about a dozen species of stove or greenhouse trees or tall shrubs: four inhabit the Indian Archipelago, two are natives of New Caledonia, and the rest are Australian. Flowers yellow or white, often rather small, disposed in axillary, pedunculate cymes; calyx five-parted; petals five, spreading; stamens indefinite. Leaves alternate, or approximate at the tips of the branches, somewhat whorled, rarely opposite. The following species are known to cultivation. They are very pretty, greenhouse, Australian plants, thriving in a compost of loam, peat, and sand. Half-ripened cuttings will root freely in sand, under a glass.

T. conferta (clustered). Australian Turpentine-tree. *fl.* yellow, in cymes of three to seven, usually on the young wood below the cluster of leaves; peduncle ¼in. to ½in. long, or rarely elongated. July to September. *l.* alternate, crowded at the ends of the branches so as to appear whorled, ovate-lanceolate, acuminate or rarely almost obtuse, 3in. to 6in. long. 1805. A tall tree. (R. G. 1188.) SYN. *T. macrophylla* (B. R. 1839).

T. depressa (flattened). A synonym of *T. suaveolens.*

T. macrophylla (large-leaved). A synonym of *T. conferta.*

T. neriifolia (Oleander-leaved). Water Gum-tree. *fl.* yellow, in opposite, axillary cymes, but forming usually a terminal corymb, the central shoots not growing out till after flowering. June to September. *l.* opposite, lanceolate, acute, narrowed into a short petiole, 1½in. to 3in. long, nerveless except the prominent midrib. 1804. A tall, slender shrub, or small tree, (L. B. C. 157.) SYNS. *Melaleuca neriifolia* (B. M. 1058), *M. salicifolia* (A. B. R. 485).

T. suaveolens (sweet-scented). *fl.* yellow, usually small, in axillary cymes; common peduncles ¼in. to ½in. long, more or less flattened. August. *l.* alternate, petiolate, ovate-elliptic, ovate-lanceolate, or elliptic-oblong, obtuse or acuminate, more or less distinctly penniveined and reticulated, 1½in. to 6in. long. 1820. Shrub or tree. SYN. *T. depressa.*

TRISTICHOUS. In three rows or ranks.

TRITELEIA (from *treis*, three, and *teleios*, complete; alluding to the perfect ternary arrangements of the parts of the flower). Triplet Lily. ORD. *Liliaceæ.* A genus consisting of about nine species of half-hardy, American, bulbous plants, now included, by Bentham and Hooker, under *Brodiæa.* Stamens affixed in the tube or throat, biseriate; filaments filiform, all bearing anthers. The species best-known to gardeners are here described;

Triteleia—*continued.*

they are often confused with *Milla.* All thrive in a rich, well-drained soil, in sunny positions. Propagated by offsets, and by seeds. *T. uniflora* is now and then planted amongst short grass; but, although very pretty for a season or two, it does not permanently hold its own under such conditions. It forms a good bulbous plant for pots, flowering profusely in early spring. The flowers open in bright, and remain nearly or quite closed in dull, weather.

T. aurea (golden). *fl.*, perianth yellow, five to six lines long, the segments green-striped, oblong-spathulate, slightly spreading; spathe valves two, connate at base; umbels two to six flowered; scapes one to three, erect, 2in. to 4in. long. April. *l.* six to eight, filiform, 3in. to 4in. long. Bulb whitish, tunicated. Monte Video, 1838. (Ref. B. 42.)

T. conspicua (conspicuous). A variety of *T. uniflora.*

T. laxa (loose).* Ithuriel's Spear. *fl.*, perianth blue, funnel-shaped, 1¼in. to 1½in. long, the segments lanceolate, acute, erecto-patent; spathe valves many; umbels eight to twenty-flowered; scapes fragile, erect, 1ft. to 1½ft. high. July. *l.* nearly flat, 1ft. to 1½ft. long, two to four lines broad. Bulb globose, ½in. to ¾in. thick. California, 1832. (B. R. 1685.)

T. Leichtlinii (Leichtlin's). *fl.* slightly fragrant; perianth 1½in. to 1¾in. long, the tube greenish, cylindrical, twice as long as the oblong, spreading segments, which are pure white on the face, but marked with a distinct, green keel down the back; umbels two or three, each one to three-flowered. January. *l.* about six to a cluster, overtopping the flowers, erect, glabrous, obtuse, 3in. to 4in. long. Chilian Andes, 1873. SYN. *Milla Leichtlinii* (B. M. 6236).

T. porrifolia (Leek-leaved).* *fl.*, perianth whitish-violet, funnel-shaped, nine to ten lines long, the segments lanceolate-spathulate, nearly thrice the length of the tube; spathe valves two, connate at base; umbels four to six-flowered; scape equalling the leaves. July. *l.* four or five, 6in. to 8in. long, one to two lines broad. Bulb ovoid, eight to twelve lines thick. Chili, 1868. SYN. *Milla porrifolia* (B. M. 5977; G. C. 1868, p. 990.)

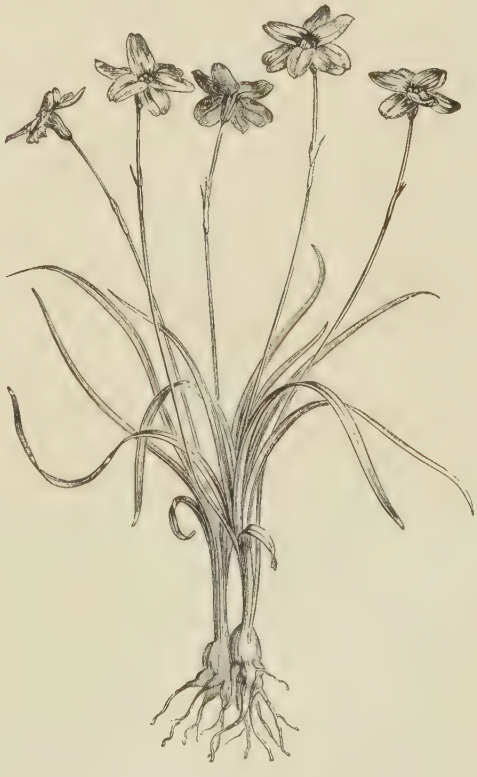

FIG. 106. TRITELEIA UNIFLORA.

T. uniflora (one-flowered).* Spring Starflower. *fl.*, perianth pale lilac, ¾in. to 1½in. long, the segments lanceolate-spathulate, slightly spreading; pedicels 1in. to 2in. long; spathe valves

Triteleia—*continued.*

two, ⅜in. to 1½in. long; scapes one or (in gardens) very rarely two-flowered. April and May. *l.* six to nine, 6in. to 12in. long, ⅛in. to ¼in. broad. Bulb proliferous. Buenos Ayres, 1836. See Fig. 106. (B. R. 1921.) SYN. *Milla uniflora* (B. M. 3327).

T. u. conspicua (conspicuous). *fl.* broadly imbricated when expanded, the segments oblong-spathulate; pedicels often longer than in the type. SYN. *T. conspicua* (Ref. B. 43).

TRITERNATE. "When a common petiole divides into three secondary petioles, which are each sub-divided into three tertiary petioles, each bearing three leaflets" (Lindley).

TRITHRINAX (from *treis*, three, and *thrinax*, a fan; alluding to the division and form of the leaves). ORD. *Palmæ*. A small genus (two or three species) of stove, unarmed Palms, natives of Brazil, and one Chilian. Flowers small, hermaphrodite; spathes many, the lower ones inserted on the peduncle, oblong, obliquely cut, the upper ones obliquely truncate; spadices spreading, on thick peduncles, with flexuous branches. Fruit baccate, one-seeded. Leaves terminal, orbicular-ovate, flabellately multifid, glabrous; sheaths fibrous and spiny, erect or deflexed. For culture, *see* **Thrinax.**

T. acanthocoma (spine-covered). *fl.*, spadix branched. *l.* large, flabelliform, cut two-thirds of the way down into numerous linear, bifid segments. Caudex dwarf, clothed with the persistent, netted sheaths, armed with numerous, stout, reflexed spines. Rio Grande, 1879. (R. G. 959; G. C. n. s., ix., p. 661.)

T. aculeata (prickly). A synonym of *Acanthorhiza aculeata.*

T. brasiliensis (Brazilian). *fl.*, spadix within the upper leaves, much branched. *l.* large, 3ft. or more long, flabelliform, nearly orbicular; sheaths at the base composed of fibres, which are at first parallel and longitudinal, then obliquely interlaced, and finally plaited together at right angles like the pandanus mats in which coffee is sent from the Antilles and Bourbon; at the summit these stripes unite, forming a series of very long, stout spines, abruptly curved downwards. Caudex slender, 6ft. to 10ft. high, 2in. to 3in. thick. Brazil, 1875. (I. H. 203.)

T. mauritiæformis (Mauritia-like). A synonym of *Sabal mauritiæformis.*

TRITICUM (the old Latin name for Wheat, probably derived from *tritus*, crushed or ground). Wheat; Wheat Grass. Including *Ægilops*. ORD. *Gramineæ*. A genus comprising scarcely half a score species of hardy, annual or biennial, erect Grasses, natives of the Mediterranean region and Western Asia. Spikelets two to five-flowered, distichously spicate, sessile, slightly compressed; glumes rigid, the two lower ones empty; spikes terminal, cylindrical or elongated; rachis flexuous, alternately excavated, continuous or rarely articulated. Grain ovoid or oblong, often villous at apex. Leaves flat. The plants formerly included in British Floras under this genus—viz., *T. caninum*, *T. junceum*, and *T. repens* (Creeping Couch or Cooch Grass), the last-named being only too well known—are now referred to *Agropyrum*, the specific names being the same in both genera. To *T. vulgare*, may be referred nearly all the varieties of Wheat, a grain well known to every one.

T. æstivum (summer). A form of *T. vulgare.*

T. hybernum (winter). A form of *T. vulgare.*

T. vulgare (common). Wheat. *fl.* awned or muticous; spikelets usually four-flowered; valves ventricose, ovate, truncate, mucronate; spikes tetragonal, imbricated, the rachis tenacious. Grain free. *h.* 3ft. *T. æstivum* and *T. hybernum* are mere forms of this, and *T. dicoccum*, *T. monococcum*, and *T. Spelta* (Spelt) are very nearly allied.

TRITOMA. A synonym of **Kniphofia** (which *see*).

TRITOMANTHE. A synonym of **Kniphofia** (which *see*).

TRITOMIUM. A synonym of **Kniphofia** (which *see*).

TRITONIA (from *triton*, a weathercock; alluding to the variable direction of the stamens in different species). SYNS. *Aletris*, *Waitzia* (of Reichenbach). Including *Montbretia*. ORD. *Irideæ*. A genus including about two dozen species of cool greenhouse or hardy, bulbous plants, indigenous to South Africa. Flower one in a spathe, sessile; perianth tube slender, straight, sometimes very short, sometimes elongated, rarely loosely incurved at apex; limb concave or broadly campanulate, nearly regular or slightly oblique, the lobes broad, all similar, or the three lower ones thickened or marked with a spot at the base, or sometimes slightly smaller; stamens affixed to the base of the limb; filaments filiform, free; spathes at the sides of the peduncle or on a few scattered branches, short, membranous, often three-toothed. Leaves few, narrow-linear or broader and ensiform, often falcate. Stem simple or slightly branched. The most important garden species are here described. All thrive in the cool greenhouse, except where otherwise indicated. The hardy species like a well-drained, sunny border, and luxuriate in a fairly dry, rich soil. Some of the greenhouse species do well in the open air if planted in a sheltered, sunny spot — such as the foot of a south wall; they should, however, be housed during winter. When grown in pots, Tritonias require plenty of water during the period of growth, and a light, airy place close to the glass. When the leaves turn yellow, water should be gradually withheld, and the roots kept dry, or nearly so, until growth recommences. Propagated by division, or by seeds.

Tritonia—*continued.*

FIG. 107. UPPER PORTIONS OF INFLORESCENCE AND LEAF OF TRITONIA HYALINA.

T. aurea (golden). A synonym of *Crocosmia aurea.*

T. capensis (Cape). *fl.* three to five, pale reddish or yellowish-white; perianth tube pale rose, twice as long as the segments; segments unequal, the lower ones red-spotted; spathe unequal-valved, straw-colour; scape 1ft. high, branched or simple, terete, flexuous at apex. September. *l.* linear-ensiform, nerved, attenuated, long-sheathing at base, shorter than the scape. 1811. (B. M. 618, 1531.) SYN. *Montbretia capensis.*

T. crispa (curled). *fl.* four to eleven, secund; perianth yellowish-white, funnel-shaped, the tube thrice as long as the segments; segments irregular, the upper ones slightly gaping, oblong-ovate, obtuse, unguiculate, flat, the lower ones narrower, obtuse, ligulate, slightly ventricose, connivent, purple-spotted in the middle; scape 6in. to 10in. long, terete, six-leaved, flexuous. April. *l.* broadly lanceolate-ensiform, undulate-crisped, margined with minute bristles. 1787. (B. M. 678.) SYN. *Gladiolus crispus* (A. B. R. 142).

T. crocata (saffron-coloured).* *fl.* seven to nine, distichous; perianth saffron-coloured, campanulate, 1in. long, the tube equalling the spathe, sub-erect, the segments sub-equal, obovate, hyaline-fenestrate at base; scape terete, flexuous, leafy at base, nearly 2ft. long. June. *l.* broadly linear-ensiform, curved, striated, acute, shorter than the scape. 1758. SYN. *Ixia crocata* (B. M. 184).

T. crocosmiflora (Crocosmia-flowered).* *fl.*, perianth about 1½in. long, funnel-shaped, with a slender, curved tube, and a spreading, six-parted, orange-scarlet limb; panicle many-flowered, erect, bent in a zigzag fashion. A handsome, hardy hybrid, raised between *T. Pottsii* and *Crocosmia aurea.* (F. M. n. s. 472; R. H. 1882, p. 124.)

T. deusta (copper-coloured). *fl.* five to ten, spicate, secund; perianth cinnabar-red, 1in. long, campanulate-infundibular, the tube short, erect; segments broadly ovate, the three inner ones carinate and spotted beneath with dark purple; spathe scarious; scape terete, flexuous, 6in. to 12in. long. May. *l.* broadly lanceolate-ensiform, acute, shorter than the scape, sheathing at base. (B. M. 622.) SYN. *Ixia crocata nigro-maculata* (A. B. R. 134).

Tritonia—*continued.*

T. fenestrata (window-like). A synonym of *T. hyalina.*

T. flava (yellow). *fl.* three or four, secund, irregularly funnel-shaped; perianth yellow, 1in. long, the tube cylindric, erect, enlarged; segments ovate, acute, the lower ones narrower; scape 6in. to 9in. long, terete, leafy at base. February. *l.* lanceolate-ensiform, acute, curved, sheathing at base, shorter than the scape, two lines broad. 1780. (B. R. 747.) SYN. *Montbretia flava.*

T. hyalina (hyaline). *fl.* seven to nine, spicate, distichous; perianth rose-colour, 1in. long, the tube short and erect; segments regularly spreading, rounded and unguiculate at apex; scape terete, 1ft. long, curved above, leafy at base. May. *l.* broadly lanceolate-ensiform, acute, thickly striated. 1801. See Fig. 107. SYN. *T. fenestrata* (B. M. 704).

T. lineata (lined). *fl.* two to seven, spicate; perianth straw-colour, veined, with orange spots, 1in. long, the tube short and sub-erect; segments sub-equal, elliptic, the lateral ones retuse, the inner ones marked with three parallel, yellow lines; scape 8in. to 18in. long, terete, erect, curved at apex, leafy at base. May. *l.* lanceolate-ensiform, acute, white-ribbed and margined. 1774. SYNS. *Gladiolus lineatus* (B. M. 487), *Montbretia lineata.*

T. miniata (scarlet).* *fl.* two to fourteen, secund or distichous; perianth scarlet, spreading-infundibular, ¾in. to 1in. long, with a short, erect, enlarged tube, and nearly regular, ovate segments; scape terete, 9in. to 12in. long, erect, curved at apex, six to eight-leaved at base. August. *l.* broadly lanceolate-ensiform, long-acuminate, yellow-striated. 1795. (B. M. 609.)

T. Pottsii (Potts').* *fl.*, perianth bright yellow, flushed on the outside with brick-red, about 1in. long, funnel-shaped, the sub-equal, oblong-obtuse segments about half as long as the tube, which is cylindrical at the base, dilated suddenly at the middle; spikes 6in. to 9in. long, equilateral, 2in. broad when expanded, twelve to twenty-flowered. August. *l.* about four in a distichous rosette at the base of the stem, linear-ensiform, 1½ft. to 2ft. long, ½in. to ¾in. broad. Stem 3ft. to 4ft. long. Bulb globose. 1877. A very valuable and ornamental, hardy plant. See Fig. 108. (B. M. 6722.) SYN. *Montbretia Pottsii* (Gn. 1880, p. 84).

FIG. 108. TRITONIA POTTSII, showing Habit and detached Flower.

T. scillaris (Squill-like). *fl.* scentless; perianth reddish, varying to white; perianth segments regularly and equidistantly disposed; tube capillary, twice or thrice as long as the spathe. May. *l.* narrow, Grass-like. SYNS. *Ixia polystachya* (B. M. 629), *I. p. incarnata* (A. B. R. 128), *I. reflexa* (A. B. R. 14).

T. securigera (hatchet-bearing). *fl.* spicate, secund; perianth brown, 1in. long, with an erect, enlarged tube, and equal, ovate, obtuse segments; scape terete, nearly 1ft. long, curved at apex, leafy at base. May. *l.* lanceolate-ensiform, flat, acute, striated, shorter than the scape, sheathing at base. 1774. SYN. *Gladiolus securiger* (B. M. 383).

T. squalida (squalid). *fl.* distichous, infundibular-campanulate; perianth whitish-rose, 1in. long, with a short, erect tube, and equal, rounded-ovate, unguiculate segments; scape erect, simple, 2ft. high, leafy at base. May. *l.* lanceolate-ensiform, thick, yellow-ribbed and margined, acute. 1774. (B. M. 581.)

Tritonia—*continued.*

T. undulata (wavy). *fl.* three or four, scentless; perianth red (said to vary through white and blue), the segments obovate, blunt, spreading; spathe membranous. June. *l.* six, linear, elegantly waved, half the length of the scape. Bulb somewhat oblong, attenuated upwards. *h.* 1ft. 1787. SYN. *Ixia crispa* (B. M. 599).

T. viridis (green). *fl.* four to seven; perianth green, the tube twice as long as the segments, somewhat arcuate-reflexed, the segments linear-oblong, sub-equal, obliquely nodding, rotate-reflexed; scape triquetrous, nearly 1ft. long, dichotomous, flexuous at apex. July. *l.* flabelloid-distichous, wavy-crisped on the margins, acute, shorter than the scape. 1788. (B. M. 1275.)

T. Wilsoni (Wilson's). *fl.*, perianth white, flushed with purple, the obovate, cuspidate segments twice as long as the tube; spikes simple or forked, lax, four to seven-flowered; scape 2ft. long below the spikes. *l.* five or six, narrow-linear, 1ft. to 1½ft. long, nearly quadrangular in section. 1886. Greenhouse.

TRIUMFETTA (named after Giov. Batt. Trionfetti, 1658-1708, an Italian botanist and author). Jamaican Paroquet-Bur. ORD. *Tiliaceæ.* A genus comprising about forty species of widely-dispersed, stove or greenhouse, stellate-pubescent herbs, sub-shrubs, or shrubs. Flowers yellow, axillary or leaf-opposed; sepals and petals five; stamens numerous. Leaves entire, or three to five-lobed, serrated. Several of the species have been introduced; but none of them are worth cultivating for ornament.

TRIURIDEÆ. A natural order of very slender, white or discoloured herbs, inhabiting tropical forests of Asia and America. Flowers minute, racemose or spicate, monœcious or diœcious, rarely unisexual; pedicels bracteate; perianth three, four, six, or eight-parted, hyaline; segments connate at base, valvate, the tips often caudate; stamens few, various in number, sessile in the base of the perianth; anthers four-celled, two-valved. Carpels many; ripe ones obovoid, coriaceous and indehiscent, or two-valved, one-seeded. Leaves wanting, or bract-like, alternate, and nerveless. Stem simple, rarely divided, filiform, straight or flexuous, erect. The order comprises only a couple of genera — *Sciaphila* and *Triuris* — and about sixteen species.

TRIXAGO (of Mœnch). A synonym of **Stachys** (which *see*).

TRIXIS (from *trixos*, triple; alluding to the three-celled, triangular capsule). SYNS. *Castra*, *Perdicium* (in part). ORD. *Compositæ.* A genus embracing about thirty species of stove or greenhouse herbs or shrubs, of variable habit, natives of Central and South America and the West Indies. Flower-heads yellow or whitish; florets bilabiate, the outer lip three-toothed, the inner bipartite or bifid; involucral bracts often two-seriate; receptacle small; pappus bristles copious. Leaves alternate, sometimes decurrent. The two members of the genus which have been introduced are described below. Both thrive in a compost of sandy loam and leaf mould. *T. divaricata auriculata* requires the protection of a warm greenhouse in winter; it may be increased by cuttings, inserted in sand, under a bell glass, in May. Seeds of *T. senecioides* should be sown in the open ground, in April.

T. auriculata (eared). A synonym of *T. divaricata auriculata.*

T. divaricata auriculata (divaricate, eared). *fl.-heads* white or yellowish-white; involucral scales acuminate. August and September. *l.* sessile, oval-lanceolate, acuminate, denticulate, nearly glabrous, dilated at base into obtuse auricles. Stems climbing, suffruticose. *h.* 1½ft. Brazil, 1827. (B. M. 2765, under name of *T. auriculata.*)

T. senecioides (Senecio-like). *fl.-heads* white, solitary, on long peduncles; involucral scales in two or three series. August and September. *l.* all sessile and amplexicaul, oblong, sinuate-lobed,

Trixis—*continued.*

toothed, pilose-glandular above, slightly woolly beneath. Stems branched from the base, panicled, pubescent and pilose-glandular. *h.* 1ft. Chili, 1821. Annual. (H. E. F. 101.)

TRIXIS (of Gærtner). A synonym of **Proserpinaca** (which *see*).

TRIZEUXIS (from *treis*, three, and *zeuxis*, a union; alluding to the cohesion of the three sepals). ORD. *Orchideæ*. A monotypic genus. The species is a small, stove, epiphytal Orchid, of no great beauty, but remarkable in having the lip superior, *i.e.*, with the parts of the flower in their proper position, the ovary not being twisted as in the generality of Orchids. The plant will succeed if fastened to a piece of wood. It may be multiplied by divisions.

T. falcata (sickle-leaved). *fl.* green, minute, densely racemose along the branches of the slender scape, which is 6in. to 12in. high. *l.* distichous-rosulate, oblong-linear, acuminate, slightly falcate, 3in. to 6in. long, ¼in. broad. Columbian Andes and Trinidad, 1820. (H. E. F. 126; L. B. C. 975; L. C. B. 2.)

TROCHETIA (named in honour of R. I. G. du Trochet, 1771-1847, a French physiologist and writer on botany). ORD. *Sterculiaceæ*. A genus comprising about half-a-dozen species of stove or greenhouse, evergreen shrubs or trees, natives of Mauritius, St. Helena, and Madagascar. Flowers rather large, often pendulous; calyx five-parted, coriaceous; petals five, flat, broad, persistent; staminal column short, bearing five ligulate staminodes; bracteoles none, or minute and deciduous; peduncles axillary, one to three-flowered. Leaves entire, coriaceous. Two species have been introduced. They thrive in a compost of well-drained loam, leaf mould. and sand. Cuttings will root in sand, under a glass.

T. erythroxylon (red-wooded). The correct name of plant described in this work as *Melhania erythroxylon*.

T. grandiflora (large-flowered). A synonym of *T. triflora*.

T. triflora (three-flowered). *fl.* white and yellow; sepals acuminate, 1in. long; petals obovate, 1½in. long; staminal column cylindrical; peduncles much deflexed, exceeding the petioles, three-flowered. December. *l.* oblong, crowded near the ends of the branches, 4in. to 6in. long, acute, sub-entire or dentate, broadly rounded at base, coriaceous, brown-tomentose beneath; petioles erect, 1in. to 2in. long. *h.* 10ft. Mauritius, 1842. Stove. (B. R. 1844, 21, under name of *T. grandiflora*.)

TROCHISCANTHES (from *trochiskos*, a small wheel, and *anthos*, a flower; in allusion to the form of the umbels). ORD. *Umbelliferæ*. A monotypic genus. The species is a tall, hardy, perennial herb, with small, white, polygamous, umbellate flowers, and ample or ternately compound radical or lower leaves. It is a native of the South of France and the Alps, and has no horticultural value.

TROCHLEATE. Twisted like a pulley.

TROCHOCARPA (from *trochos*, a wheel, and *karpos*, fruit; alluding to the radiated arrangement of the cells of the fruit). SYN. *Decaspora*. ORD. *Epacrideæ*. A genus including half-a-dozen species of greenhouse, erect or diffuse shrubs or small trees, limited to Australia. Flowers spicate, each sessile within the small, subtending bract and two bracteoles; calyx five-parted; corolla tube cylindrical or campanulate, glabrous or with reflexed hairs inside at the top; lobes recurved, usually shorter than the tube; filaments short, filiform. Fruit a globular or depressed drupe, containing ten stones (or fewer by abortion). Leaves usually petiolate, flat or convex. *T. laurina*, the only species yet introduced, is a handsome tree, thriving in sand and fibry peat. Cuttings of the points of young shoots, or stubby, short side shoots getting firm at the base, should be inserted in sand, under a bell glass, and kept close in a frame or pit, at any time during spring or summer. More heat and moisture must be allowed after the flowering period, and an abundance of air and light before the end of the autumn.

Trochocarpa—*continued.*

T. laurina (Laurel-like). *fl.* white, small, in terminal, solitary or clustered, interrupted spikes, ¼in. to 1in. long. June. *l.* usually clustered at the end of each year's shoots, so as to appear almost whorled, petiolate, broadly oval or elliptic, acuminate, shining, five to seven-nerved on both sides, mostly 1½in. to 2in. long. *h.* 20ft. to 40ft. 1829. (B. M. 3324.)

TROCHOSTIGMA. A synonym of **Actinidia** (which *see*).

TROLL FLOWER. An old name for the genus *Trollius*.

TROLLIUS (said to be derived from an old German word *trol*, a globe). Globe Flower; Globe Ranunculus. ORD. *Ranunculaceæ*. A genus comprising about nine species of hardy, perennial, erect herbs, inhabiting the temperate and frigid regions of the Northern hemisphere. Flowers yellow or lilac, ample, solitary or few; sepals five or indefinite, regular, petaloid, commonly deciduous; petals five to eight, small, clawed, rarely indefinite, long-linear. Leaves alternate, palmately lobed or dissected. The best-known species are here described. A rather heavy soil and moist situation are most generally suitable, but Globe Flowers succeed well in the front part of mixed borders, and in many other positions where the soil is fairly good. The plants are of very compact and floriferous habit. Propagation may be effected by divisions, which should preferably be made in September; or by seeds. The latter do not usually vegetate until the year after they are sown.

FIG. 109. FLOWERING STEM AND ROOT-LEAF OF TROLLIUS EUROPÆUS.

T. acaulis (stemless). *fl.* golden-yellow, 2in. in diameter; sepals seven, broadly oval, obtuse; petals fourteen, narrow-cuneate, ¼in. long, with a very short claw. July. *l.* five-partite, argutely cut. Stem dwarf, leafy above. Western Himalayas, 1841. (B. R. xxix. 32.)

Trollius—*continued.*

T. altaicus (Altaian). *fl.* pale orange or yellow, 2in. in diameter; sepals ten, often fifteen to twenty, broad, obtuse, rarely acute, occasionally crenulate; petals five to fifteen, narrow-linear, obtuse. *l.* much divided, similar to those of *T. europæus*. *h.* 1ft. to 1½ft. 1857. (R. G. 188.)

T. americanus (American). A synonym of *T. laxus*.

T. asiaticus (Asiatic). *fl.* dark yellow; sepals ten, spreading; petals ten, longer than the stamens. May and June. *h.* 1ft. to 1½ft. Siberia, 1817. This species closely resembles *T. europæus*, but the stems are usually one-flowered. (B. M. 235; R. G. 403.)

T. caucasicus (Caucasian). *fl.* yellow; petals shorter than the stamens. Otherwise this species closely resembles *T. asiaticus*. Caucasus, 1817.

T. europæus (European).* Boits; Common Globe Flower; Golden Ball, &c. *fl.* pale yellow, globose, 1in. to 1½in. in diameter; sepals orbicular, concave; petals oblong, equalling the short stamens. June to August. *l.*, radical ones petiolate, sub-orbicular, five-partite, the segments cuneate, lobed and cleft; cauline ones smaller, sessile. Stem 6in. to 2ft. high, simple, leafy. Arctic Europe (Britain), &c. See Fig. 109. (Sy. En. B. 42.)

T. laxus (loose). *fl.* pale greenish-yellow or nearly white, twice the size of the common Buttercup; sepals five or six, spreading; petals fifteen to twenty-five, inconspicuous, much shorter than the stamens. May. *l.* palmately cut. *h.* 6in. to 9in. North America, 1805. SYN. *T. americanus* (B. M. 1988; L. B. C. 56).

T. patulus (spreading). *fl.* golden-yellow; sepals five, spreading; petals one to five, equalling the stamens. *h.* 3in. to 12in. Siberia, 1800.

TROMOTRICHE. Included under **Stapelia** (which *see*).

TROPÆOLEÆ. Included under *Geraniaceæ*.

TROPÆOLUM (from *tropaion*, a trophy; the leaves are of the form of a buckler, and the flowers resemble an empty helmet). Golden Nasturtium; Indian Cress; Yellow Larkspur. ORD. *Geraniaceæ*. A genus comprising about thirty-five species of very handsome, twining or rarely diffuse, greenhouse or hardy, South American, annual or perennial herbs. Flowers orange, yellow, or rarely purple or blue, irregular; sepals five, loosely imbricated or sub-valvate, connate at base, the dorsal one produced into a free spur; petals five, or fewer by abortion, loosely perigynous, imbricated, the two upper ones more or less dissimilar to the rest; stamens eight, free, unequal; peduncles axillary, one-flowered. Fruit consisting of indehiscent, hardened-fleshy, wrinkled, one-seeded carpels. Leaves alternate, peltate or palmately angled, lobed or dissected; stipules wanting, or rarely minute. Tropæolums are mostly familiar twining plants, well adapted for growing in pots or planting out in greenhouses, and training up rafters, &c. They also succeed well outside during summer, but the foliage will not withstand the least frost without injury. For covering arbours, &c., or anything which is unsightly, the tall-growing annuals are not easily surpassed; *T. Lobbianum*, *T. majus*, and *T. peregrinum* are the best for the purpose. The dwarf varieties of *Tropæolum* are beautiful objects for mixed flower borders, and for placing in beds by themselves; they are exceedingly compact and floriferous. The annual species are readily raised from seeds, sown in the open border, in any moderately rich soil, in spring; or, as is best with *T. peregrinum*, they may be sown in pots, under glass, hardened off, and planted out at the end of May or beginning of June. The double varieties are practically perennials, as they must be increased by cuttings, which root readily in bottom heat; during winter, the plants must be kept in a light, airy situation. The tuberous-rooted section, such as *T. azureum* and *T. tricolorum*, thrive in sandy peat and leaf mould, or in turfy loam and peat, and do best under cool-house treatment. They are best grown singly in pots, and each plant trained over a little trellis; when in flower, they are exceedingly pretty and interesting. When growing, they require plenty of light, and abundance of water; when the stems die down, the pots should be stored away in some dry, cool spot, and water withheld until growth recommences, when the tubers must be carefully shaken out and repotted; this section may be increased from seeds, or by means of cuttings of the slender, wiry shoots, which callus and form small tubers in one season. *T. speciosum* requires a constantly moist and shaded position in a peat border, and is impatient of disturbance at the roots; it is propagated either from seeds, or by division of the long-creeping, underground rhizomes. *T. polyphyllum* likes a warm, sunny spot, rather dry than otherwise. Tropæolums do not require a very rich soil; they flower more profusely if not encouraged to grow over-luxuriantly.

Tropæolum—*continued.*

Except where otherwise stated, the under-mentioned species are perennial twiners.

T. aduncum (hooked). A synonym of *T. peregrinum*.

T. albiflorum (white-flowered). *fl.*, petals whitish, within lined and dotted with gold and purple, large, plicate, undulated, the lower ones very long- and narrowly-unguiculate. Summer. *l.* small, glaucous, digitate; segments three to five. Stems very slender, elongated. Peru or Chili. Greenhouse. (F. d. S. 241.)

T. azureum (azure-blue).* *fl.* scarcely odorous; petals azure-blue, equal, obovate, attenuated into a long, greenish-white claw, deeply emarginate at apex. October. *l.* peltate, deeply five-lobed; lobes obovate or obversely lanceolate, the middle one larger and mucronate. Chili, 1842. Greenhouse. (B. R. xxviii. 65; F. d. S. May, 1846; P. M. B. ix. 247.) *grandiflorum* is a large-flowered form. (F. d. S. 1160; I. H. iii. 85.)

T. azureum (azure-blue), of Hooker. A synonym of *T. violæfolium*.

T. Beuthii (Beuth's). *fl.*, calyx segments apiculate, equalling the straight spur; petals yellow; peduncles filiform, twice as long as the leaves. June. *l.* sub-orbicular, deeply peltately cut, pale green beneath; leaflets five or six, obovate, the front one larger, retuse-apiculate at apex. Root tuberous. Bolivia, 1850. Half-hardy.

T. brachyceras (short-horned). *fl.*, calyx segments obtuse; spur very short, obtuse; petals yellow, conformed. June. *l.* peltately cut; segments six or seven, oblong-obovate, entire, sessile. Root tuberous. Chili, 1830. Half-hardy. (B. M. 3851; B. R. 1926; F. d. S. 368; P. M. B. iv. 55; S. B. F. G. ser. ii. 370.)

T. chrysanthum (golden-flowered). *fl.*, petals golden-yellow, the two upper ones cuneate, shorter than the calyx and lined below with orange-red veins, the three lower ones longer, unguiculate, flabellately plicate. Summer. *l.* peltate, orbicular-triangular, truncate at base, angularly three-lobed at apex, the margins obsoletely repand crenate. New Grenada, 1874. Greenhouse. (F. d. S. x. 1005; I. H. xix. 102.)

T. crenatiflorum (crenate-flowered). *fl.*, petals yellow, obovate, spreading, sub-equal, truncate and somewhat bicrenate at apex, the two upper ones lined with blood-colour. June. *l.* peltate, semi-orbicular, five-lobed; lobes obtuse or retuse, mucronulate. Peru, 1844. Greenhouse. (B. M. 4245; F. d. S. 166.)

T. Deckerianum (Decker's). *fl.*, calyx pubescent, longer than the straight, scarlet spur; petals blue, unequal, toothed, fimbriate-ciliated; filaments and anthers blue; style yellow. July. *l.* peltate, triangular, five to seven-lobed, transversely truncate at base. Venezuela, 1849. Greenhouse. (B. H. ii., p. 245; F. d. S. 490; L. & P. F. G. i. 16.)

T. digitatum (digitate-leaved). *fl.*, sepals appendiculate at base; petals golden, dentate-ciliated. July. *l.* peltate, five to seven-lobed; lobes rounded, entire. Venezuela, 1850. Hardy annual. (R. G. 1146, bearing name of *T. Gœrtnerianum* on plate, but *T. digitatum* in letter-press.)

T. edule (edible). *fl.*, spur acuminate; petals orange and green, sub-conformed, obcordate, equalling the sepals. March. *l.* pseudo-compound, peltate, six-lobed; leaflets or segments oblong-lanceolate, attenuated at both ends, glabrous. Stems terete. Chili, 1841. Half-hardy. (B. 248; P. M. B. ix. 127.)

T. Gærtnerianum. *See* **T. digitatum.**

T. Jarrattii (Jarratt's).* *fl.*, calyx bright orange-scarlet, spotted with yellow at base; petals bright yellow, the two upper ones pencilled with rich brown; pedicels 2½in. to 3½in. long. June. *l.* alternate, six or seven-lobed; petioles 1in. long, slender, twining. Santiago, 1836. Greenhouse. (P. M. B. v. 29.)

T. Lobbianum (Lobb's).* *fl.*, calyx long-spurred, pilose; petals orange, obovate, the two upper ones entire, scarcely lobed, the three lower ones smaller, deeply toothed, fringed below, long-clawed. November. *l.* peltate-orbicular, obscurely lobed, glaucous beneath; lobes mucronulate; petioles (and peduncles) pilose. Columbia, 1843. Greenhouse. (B. M. 4097; F. d. S. ii. 3; P. M. B. xi. 271.)

T. L. fimbriatum (fringed). *fl.*, petals fringed. *l.* lobed. Of hybrid origin. (R. H. 1856, p. 101.)

T. majus (greatest). Great Indian Cress or Nasturtium. *fl.* rich orange, large and showy, the two upper petals marked with deep reddish-brown, all obtuse; peduncles long. June to October. *l.* alternate, entire, nearly round peltate, sometimes

Tropæolum—*continued.*

FIG. 110. PORTION OF FLOWERING STEM OF TROPÆOLUM MAJUS.

undulated or lobed. Peru, 1686. Hardy annual. The flowers and young leaves are frequently used in salads, and the former also for garnishing. If gathered when young and quite green,

FIG. 111. TROPÆOLUM MAJUS ATROPURPUREUM NANUM, showing Habit, detached Flower, and Leaf.

the fruits make an agreeable pickle. In certain conditions of atmosphere, the flowers have the power of emitting electric

FIG. 112. TROPÆOLUM MAJUS NANUM COCCINEUM FOLIIS-AUREIS.

Tropæolum—*continued.*

sparks in the evening. See Fig. 110. (B. M. 23.) There are very many varieties of this species, including *atropurpureum nanum* (see Fig. 111; F. d. S. 1286), a dwarf sort, known in gardens as TOM THUMB; *atrosanguineum* (B. M. 3375; P. M. B. i. 176; S. B. F. G. ser. ii. 204), a form with dark blood-coloured flowers; and numerous double-flowered forms of which, perhaps, GRANDIFLORUM PLENISSIMUM, double yellow, with a deep maroon blotch at the base of each petal, and HERMINE GRASHOFF (Gn. xx. 393), with scarlet flowers, are two of the best. A few of the finest dwarf kinds are: EMPRESS OF INDIA, bright crimson; GOLDEN KING, golden-yellow; KING OF TOM THUMBS, scarlet; KING THEODORE, very dark; PEARL, creamy-white; RUBY KING, rosy-scarlet. A TOM THUMB form, with golden leaves, is represented in Fig. 112.

FIG. 113. TROPÆOLUM TRICOLORUM, showing Habit and Portion of detached Flowering Stem.

T. minus (smallest). Small Indian Cress or Nasturtium. *fl.* deep yellow, streaked with orange and red; petals each ending in a bristle-like point. June to October. *l.* somewhat repand. Peru, 1596. Hardy annual. This resembles *T. majus*, but is much smaller and weaker. The fruits, being smaller, are preferred to those of *T. majus* as a substitute for capers. (B. M. 98.)

T. Moritzianum (Moritz'). *fl.*, spur dirty yellow, greenish towards the apex, straight; petals yellow, the upper ones margined and nerved with cinnabar-red, incised-ciliated. July. *l.* peltate, seven-lobed, transversely truncate at base, glabrous; lobes rounded, obsoletely mucronate. Caracas, 1839. Greenhouse. (B. v. 221; B. M. 3844; P. M. B. viii. 199.)

T. pendulum (pendulous). *fl.* pendulous; calyx yellow, the spur straight; petals yellow, spathulate, the two upper ones marked with parallel, red lines and a dingy violet spot, the three lower ones self-coloured. July. *l.* peltate, glaucous beneath, rounded-truncate at base; lobes five, the middle one mucronate. Branches terete. Central America, 1852. Greenhouse.

T. pentaphyllum (five-leaved). Five-fingered Indian Cress. *fl.*, calyx dull purple, 1½in. long, the limb greenish, marked with deep purple within; petals bright vermilion, small, roundish, sub-unguiculate; peduncles 4in. long, solitary, axillary. June and July. *l.* about 2in. across, digitate, of five oblong, entire, petiolulate, soft, glabrous, spreading leaflets; petioles purple, 2in. long, twisted like tendrils. Stem purple, slender, greatly elongated, slightly twisted, branched. Root a large, oblong tuber. Buenos Ayres, 1829. Half-hardy. (B. M. 3190.) SYN. *Chymocarpus pentaphyllus.*

T. peregrinum (exotic).* Canary-bird Flower; Canary Creeper. *fl.*, petals yellow, scarcely longer than the calyx, the two upper ones lobed, mucronate, the three lower ones smaller, fringed; spur hooked, about the length of the upper petals. June to October. *l.* peltate-nerved, somewhat kidney-shaped, five to seven-lobed; lobes entire, mucronate. Peru and Mexico, 1810. Hardy annual or greenhouse perennial. (A. B. R. 597; B. M. 1351; B. R. 718; S. B. F. G. ser. ii. 134.) SYN. *T. aduncum.*

T. pinnatum (pinnate-flowered). *fl.* pinnate; petals yellow, wedge-shaped, toothed at the apex. June to November. *l.* somewhat peltate; lobes obtuse, unequal. Hybrid, raised in 1800. Greenhouse. (A. B. R. 535.)

T. polyphyllum (many-leaved).* Yellow Rock Indian Cress. *fl.*, calyx with an attenuated spur; petals yellow, longer than the calyx, obcordate, the upper ones obovate, sessile, the lateral lower ones emarginate, clawed. June. *l.*, leaflets ten to twelve, digitate, fleshy, oblong, entire, the middle one trifid. Chili, 1827. Plant prostrate. Hardy. (B. M. 4042; F. d. S. 2066; G. C. n. s., xx., p. 241; P. M. B. x. 175.)

Tropæolum—*continued.*

T. sessilifolium (sessile-leaved). *fl.* on solitary or twin terminal peduncles; calyx with a long spur; petals red, shaded with violet, conformed, spathulate-obovate, emarginate, exceeding the calyx. Summer. *l.* sessile, five-lobed; lobes oblong, glabrous, glaucous. Chili, 1868. Plant prostrate. Greenhouse. (G. C. 1868, p. 842.)

T. Smithii (Smith's). *fl.*, spur of the calyx straight, twice as long as the corolla; petals yellow, all lobed and fringed. June. *l.* peltate-nerved, deeply palmately five-lobed. New Grenada, 1775. Hardy annual or greenhouse perennial. (B. M. 4385; F. d. S. 384.)

T. speciosum (showy).* Flame-flowered Nasturtium. *fl.*, spur long; petals scarlet, obcordate, exceeding the calyx, the upper ones narrow-cuneate, the lower ones sub-orbicular. June. *l.* sub-peltate, six-lobed; lobes oblong, obtuse, pilose-pubescent beneath. Stems pilose-pubescent. Chili, 1846. Hardy. (B. M. 4323; F. d. S. 281; P. M. B. xiv. 173.)

T. tricolorum (three-coloured).* *fl.* solitary, much shorter than the pedicels; calyx orange-scarlet, tipped with black, turbinate; petals orange, obovate, entire, equal, shorter than the slender, attenuated spur. June to October. *l.* peltately five or six-parted; segments obovate or oblong, obtuse. Chili, 1828. Half-hardy. A very showy plant. See Fig. 113. (B. M. 3169: B. R. 1935; F. d. S. 369, 1881; P. M. B. ii. 123; S. B. F. G. 270.) There are varieties of this species with yellow and green flowers, viz., *T. t. Regelianum* and *T. t. Schultzii* (R. G. 428).

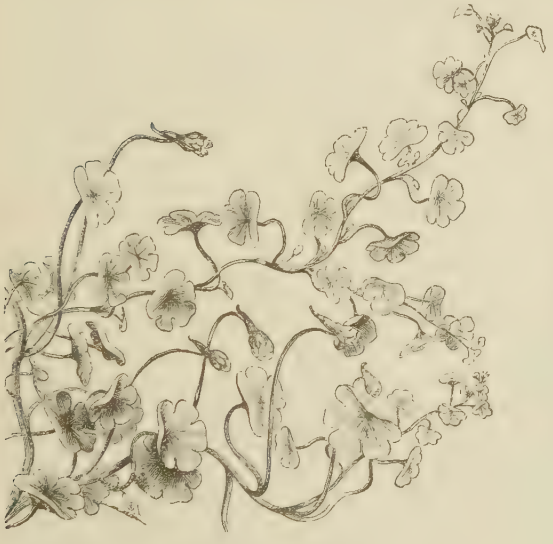

FIG. 114. PORTION OF FLOWERING STEM OF TROPÆOLUM TUBEROSUM.

T. tuberosum (tuberous-rooted). Peruvian Nasturtium. *fl.*, petals yellow and red, almost as long as the calyx, entire or toothed. September. *l.* peltate-nerved, five-lobed, transversely truncate at base, smooth. Roots tuberous, depressed, edible when boiled. Peru, 1827. Half-hardy. See Fig. 114. (B. H. ii. 36; B. M. 3714; F. d. S. 452; P. M. B. v. 49; R. H. 1853, 18.)

T. umbellatum (umbellate-flowered). *fl.* umbellate; calyx cylindrical, longer than the slightly curved, obtuse spur; petals orange-red, spathulate, straight, acute, three of them exceeding the calyx, the other two minute and scale-like. June. *l.* somewhat peltate, cordate, five-lobed. Quito, 1846. Greenhouse. (B. M. 4337; F. d. S. 302.)

T. violæfolium (Viola-leaved). *fl.*, spur short, slightly curved; petals at first of a beautiful azure-blue, becoming paler, spreading, equal, obovate, deeply emarginate at apex, attenuated into long, whitish claws. October. *l.* peltate, deeply five-lobed; segments unequal, obovate or obversely lanceolate, obtuse, the middle one larger, mucronulate. Root tuberous. Chili. Greenhouse. (B. M. 3985, under name of *T. azureum.*)

T. Wagnerianum (Wagner's). *fl.*, spur pink, straight, tubular, 1in. to 1¼in. long; petals violet, wedge-shaped, seven-toothed towards the apex; pedicels very slender, about 2in. long. July. *l.* peltate, oblong-triangular, rather obliquely-hastate, truncate at base, acuminate at apex, pale beneath. Venezuela, 1850. Greenhouse. (B. H. ii. 1; F. d. S. 553.)

TROPHIANTHUS. A synonym of **Aspasia** (which *see*).

TROPHIS (from *trophe*, fodder; alluding to the use of some of the species). Ramoon-tree. SYN. *Bucephalon.* ORD. *Urticaceæ.* A small genus (five or six species) of stove trees or shrubs, inhabiting the West Indies, Mexico, and the Andes of South America. Flowers sessile or shortly pedicellate; spikes or racemes solitary or twin in the axils, the males loosely bundle-flowered, the females often short and few-flowered. Leaves alternate, petiolate, entire or few-toothed, those of the sterile branches sometimes lobed. The leaves of *T. americana* are said to be occasionally used in the West Indies as fodder. One or two of the species have been introduced, but they are probably lost to cultivation.

TROPICAL DOCKWEED. *See* **Pistia Stratiotes.**

TROPIDIA (from *tropis, tropidos*, a keel; in allusion to the keel-shaped labellum). SYNS. *Cnemidia, Decaisnea, Govindovia, Ptychochilus.* ORD. *Orchideæ.* A small genus (about five species) of tall, leafy, often branched, stove, terrestrial Orchids, natives of the East Indies, the Malayan Archipelago, and the Pacific Islands. Flowers mediocre, in short spikes; sepals connivent; lip sessile at the base of the column, erect. Leaves ample or reed-like. None of the species are in cultivation in this country.

TROPIS. In Greek compounds, this term signifies the keel of a papilionaceous flower or any part resembling it.

TROS. Included under *Narcissus.*

TROTTLES. *See* **Symphytum asperrimum.**

TROWEL. A garden Trowel is a most useful and well-nigh indispensable tool for lifting small plants from one place and inserting them in another, and for planting anything out which has previously been growing in pots, as, for example, during the bedding-out season, when numerous subjects have to be so transferred. Trowels are preferable to dibbers at any time, as with them the holes may be made larger, and the roots spread out better. Fern Trowels are narrower than the ordinary garden kind; as the name implies, they are intended for lifting Ferns, and are chiefly used by collectors of these plants when searching for them in their native habitats.

TROXIMON (from *troximos*, edible, which the plants of this genus are not). SYN. *Agoseris.* Including *Ammogeton* and *Macrorhynchus.* ORD. *Compositæ.* A genus comprising about sixteen species of hardy, almost stemless, annual or perennial herbs, natives of North-western and Southern extra-tropical America. Flower-heads yellow or orange, homogamous; florets ligulate, truncately five-toothed at apex; involucral bracts in many series, the outer ones gradually shorter and broader; receptacle flat, naked or foveolate, rarely bearing a few paleæ between the florets; achenes glabrous; pappus bristles copious; scape erect, leafless, one-headed. Leaves radical, entire, deeply toothed, or pinnatifid. *T. glaucum* and its variety are now probably the only known garden representatives of the genus, although others have been introduced. They are perennials, thriving in sandy loam. Propagation may be effected by divisions.

T. glaucum (glaucous). *fl.-heads* bright yellow, nearly 1in. in diameter; involucral bracts loosely imbricated in three or four series. May and June. *l.* linear-lanceolate, acute, entire, or rarely with one or two small teeth. *h.* 1ft. United States, 1811. (B. M. 1667.)

T. g. dasycephalum (thick-headed). *fl.-heads*, receptacle often bearing a few chaffy scales among the florets; involucre woolly, at least when young. *l.* (and scape) often somewhat pubescent. (B. M. 3462). SYN. *Ammogeton scorzoneræfolium.*

TRUE LOVE. *See* **Paris quadrifolia.**

TRUFFLES. Fungi, living below ground, or rarely on the surface of the soil. They are, externally, somewhat like potatoes or other tubers; hence, the genus of most importance has been named *Tuber*, and from it

Truffles—*continued.*

the order is called *Tuberacei*. The structure of the order is as follows: The exterior is covered with a layer of thickened cells, which incloses a mass of mycelium. In

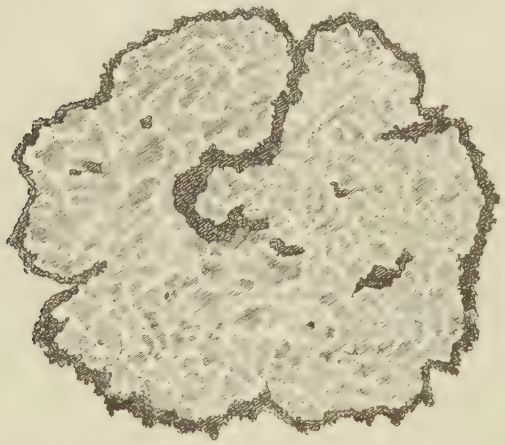

FIG. 115. TUBER—Section showing dark Surface Layer and Cavities (shaded) in which the Asci and Spores lie.

this may be cavities (see Fig. 115), lined with a layer of cylindrical asci; or the asci may be packed among the cells of the mycelium, without cavities. In each ascus is a definite number of spores (usually four or eight), which are often beautifully marked and ridged, and are usually coloured. The *Tuberacei* thus belong to the division *Ascomycetes*. While young, they are fleshy in texture; but when mature, the interior is filled with a dusty-brown mass of spores, so that, in this stage, they look much like Puff-balls (*see* **Lycoperdon**), to which, however, they are not nearly related. The term Truffle is sometimes employed to denote a second group of subterranean Fungi, of very similar appearance, named the *Hypogæi*; but in the latter there are no asci, and the spores are produced, singly, on the tips of outgrowths from the ends of large cells (basidia), as in Mushrooms; but the basidia line internal cavities, instead of being exposed on the surface, as in the last-named (which *see*). It is better to restrict the name Truffles to the *Tuberacei*, or to distinguish the latter as the "true Truffles." They include a considerable number of genera, of which a good many are represented in the South of England; but they become much rarer northwards, and few reach Scotland. The number of species is comparatively small. They vary in size, from about ¼in. to 3in. or 4in. in diameter. The genera are distinguished by the nature and markings of the outer coat (peridium), and by the forms of the asci and spores.

The chief importance of Truffles arises from the fact that several species are highly esteemed as condiments, on account of the flavour that they impart to the food with which they are cooked. The edible Truffles chiefly belong to the genus *Tuber*, *T. æstivum* being almost the only species sold in English markets. In France and other European countries, several other species are also made use of, and are even more highly esteemed. The large White Truffle (*Choiromyces albus*) is sometimes employed, but is inferior to the genus *Tuber*. Owing to their concealed growth, Truffles are very apt to be overlooked; and Truffle-hunters take advantage of the keen sense of smell of dogs, or occasionally of pigs, these animals being trained to hunt over the ground, and to stop over the spots where they scent the Fungi. The plants prefer chalky soils, and there seems to be a connection between the various species and certain trees. For example, *T. æstivum*

Truffles—*continued.*

is usually found in the shade of Beeches, though it also grows under Birches, Chestnuts, Hazels, Hornbeams, and Oaks; and *T. macrosporum* and *T. brumale* prefer the shade of Oaks. Attempts have been made to cultivate Truffles, or, rather, to promote their growth in suitable localities. The method found most successful in France is to inclose spaces over chalky soils, and to sow them with acorns. When the Oaks are about twelve years old, Truffles are usually sufficiently abundant in the plantation to be worth working; and they continue to be produced for twenty or thirty years. It has been observed on Salisbury Plain that when plantations of Beeches are formed, alone or mixed with Firs, in a few years Truffles are to be found in them, and they continue productive for from ten to fifteen years. Experiments by watering the soil with the washings from sliced Truffles have not given decisive results.

TRUMPET CREEPER. A common name for *Tecoma radicans* and other species.

TRUMPET FLOWER. A common name for various large trumpet-shaped flowers; *e.g.*, those of *Bignonia*, *Tecoma*, &c.

TRUMPET HONEYSUCKLE. A common name for **Lonicera sempervirens** (which *see*).

TRUMPET LEAF. *See* **Sarracenia.**

TRUMPET LILY. *See* **Richardia africana.**

TRUMPETS. A common name for **Sarracenia flava** (which *see*).

TRUNCARIA. A synonym of **Adelobotrys** (which *see*).

TRUNCATE. Terminating very bluntly and abruptly, as if a piece had been broken off.

TRYMALIUM (from *trymalia*, a perforation; in reference to the small holes at the top of the capsule). ORD. *Rhamneæ*. A small genus (five species) of Australian, greenhouse shrubs, with the habit and deciduous stipules and bracts of *Pomaderris*, but with smaller flowers and a more slender inflorescence. Calyx limb five-lobed to the base; petals five, hood-shaped, entire or three-lobed, but not usually inclosing the anthers; stamens five, the filaments rather short; panicles usually narrow, or the cymes few-flowered. None of the species are particularly ornamental. *T. Billardieri* is grown in this country. It thrives in sandy loam and leaf mould, and may be increased by cuttings, inserted in a similar compost, under a bell glass.

T. Billardieri (Labillardière's). *fl.* numerous, in loose, narrow, terminal panicles 2in. to 6in. long. *l.* sometimes broadly ovate or obovate, very obtuse, 1in. to 2in. long, sometimes ovate or ovate-lanceolate, more or less acuminate, 2in. to 3in. long, entire or crenate, glabrous or pubescent above, white, hoary, or villous beneath. A tall shrub.

TRYPHÆNA (from a Greek proper name). Also written *Triphæna*. A genus of Night-moths, nearly related to **Noctua** (which *see*) and *Agrotis*; but the species are readily distinguished from those of both genera by the hind wings, which are yellow or orange, with a black band near the hind margin, from which it is separated only by a fringe similar in colour to the area of the wings. There is usually a dark, crescentic mark near the middle of each hind wing. These moths are well known to amateur entomologists as the "Yellow-Underwings." The fore wings are rather narrow, and vary in ground-colour from grey to olive-green or rich umber-brown. Their front margin is sometimes pale; and there are several narrow cross-bars (some paler and others darker than the ground-colour), and two spots near the middle of each wing outlined with grey. There are six British species, varying from 1¼in. to 2¼in. in spread of front wings. They differ, also, in the breadth

Tryphæna—*continued.*

of the black band, and in the depth of colour in the yellow or orange area of the hind wings. The larvæ mostly belong to the group of **Surface Caterpillars** (which *see*) in general appearance and in habits. The body is smooth and cylindrical, and the head small. The colour varies from dingy ochreous, or dull yellowish-green, to dark brown, with (usually) a paler line down the back, and pale and dark mottlings; but space will not permit of giving minute details.

A very common species is *T. pronuba* (Common Yellow Underwing). The front wings expand to from 2in. to 2¼in.; the hind wings are yellow, with the black marginal band rather narrow, and there is no dark spot in their middle. The larvæ of this species feed near the top of the roots of Lettuces, Cabbages, and almost all other kinds of garden vegetables, as well as on many flowering plants. They burrow into the plants, or hide just below the surface of the soil; and when full-fed, in spring, they make earthen cocoons, and become pupæ in the soil. *T. Ianthina* (Lesser Broad-bordered Yellow Underwing) has an expanse of wing of about 1¾in. The front wings are rich brown, with purple tints, and three wedges of grey extending inwards from the front margin. The hind wings have the base black, and the broad, marginal band intense velvety-black; the crest of each wing is orange. The larvæ feed in Primroses, and in other garden flowers, during winter, and become pupæ, in spring, in cocoons in the soil. *T. interjecta* (Least Yellow Underwing) reaches only about 1¼in. in span. The front wings are rusty-brown or dull red, with darker lines, and a smoky band near the hind margin. The hind wings are dark at the base, with a smoky-black marginal band, a similar shade along the inner margin, and a dark spot in the yellow median area. The larvæ feed on low plants, such as Dock and other weeds, in winter and spring, like those already mentioned. *T. fimbria* (Broad-bordered Yellow Underwing) has a spread of wings of 2in. to 2¼in. It is easily known by its size, and by the very broad, intensely black marginal band, and the deep orange, unspotted area (extending to the base) of the hind wings. The larvæ feed in autumn on leaves of Birch, Sallow, and other trees, hybernate, and in spring eat the young leaves of the same trees, crawling down the trunk before daylight appears, and hiding in the ground all day, to crawl up again in the evening. *T. orbona* (Lesser Yellow Underwing) varies in spread of wings from 1½in. to 1¾in. The front wings vary in depth of colour. The hind wings are yellowish, clouded with grey at the base, and have a dark grey, crescentic spot in the middle, and a rather narrow, blackish marginal band. The larvæ feed in autumn on Chickweed and other low plants; but, after hybernation, in spring they ascend the stems of Hawthorn and Sallow, and eat the young leaves. *T. subsequa* is too uncommon to call for special mention here.

Remedies. These should be employed as recommended against **Noctua** (which *see*).

TSIANA. A synonym of **Costus** (which *see*).

TSUGA (the Japanese name for these trees). ORD. *Coniferæ*. A small genus (eight species) of hardy, evergreen trees, with the ultimate branches slender and often pendulous; three are North American, and two Asiatic. Flowers monœcious; males sub-sessile, solitary in the axils of the upper leaves; female catkins solitary, terminal, globose, with few empty, stipitate scales. Leaves acicular

Tsuga—*continued.*

or narrow-linear, spirally scattered, sometimes distichously spreading, flat or (in one species) convex above. Cones sub-globose, often reflexed, 1in. or less in length, or (in one species) rather longer. The species of this genus are often confused with those of *Abies*. For culture, *see* **Pinus**.

T. Brunoniana (Brown's). *l.* solitary, somewhat distichous or scattered, flat, linear, spreading, obtuse or slightly pointed, minutely toothed towards the apex, reflexed on the margins, glossy-green above, milky-mealy below. *cones* terminal, 1in. long, solitary, sessile. Branches numerous, slender, pendent. *h.* 70ft. to 80ft. Bhotan. (G. C. n. s., xxvi., pp. 73, 501.) SYNS. *Abies Brunoniana, A. dumosa.*

T. canadensis (Canadian).* Hemlock Spruce. *l.* solitary, flat, irregularly distichous, ¼in. to ⅜in. long, downy when young, rough at the margins, blunt, vivid light green above, with two silvery stripes beneath. *cones* pendulous at the tips of the branches, ⅜in. to ⅞in. long, oval. Branches numerous, slender and downy when young, spreading, rather flat. *h.* 60ft. to 80ft. North America, 1736. SYN. *Abies canadensis.* The following varieties are enumerated by Gordon, in "The Pinetum":

FIG. 116 BRANCH, CONE, AND SEED OF TSUGA ROEZLII.

T. c. alba-spica (white-spiked). A rather pretty form, differing from the type in having the leaves on the ends of the young growth of a whitish colour.

T. c. gracilis (slender). *l.* linear, blunt-pointed, glossy above, glaucous beneath, more or less obliquely placed all round the shoots, and seldom more than ¼in. long. Branches and branchlets very slender, little divided, more or less drooping at the ends.

T. c. milfordensis (Milford). A dwarf variety, globular in form, with the shoots slender and drooping, and the leaves much smaller than those of the type; but it is quite distinct from *gracilis*.

T. c. nana (dwarf). A dwarf variety, not exceeding 3ft. in height, and spreading on the ground, with a more tufted foliage than the type.

Tsuga —*continued.*

T. caroliniana (Carolina). *l.* larger, wider, and darker-coloured than in *T. canadensis*, six to ten lines long, and nearly one line broad, retuse or often notched at the ends. *cones* also larger, ten to sixteen lines long, the scales oblong, longer than wide, spreading when ripe at nearly right angles, the broad bracts slightly cuspidate, the seeds less than half the length of the narrow wing. *h.* 50ft. to 60ft. North Carolina, 1886. A compact, pyramidal tree, with flattened spray. (G. C. n. s., xxvi., p. 781.)

T. Hookeriana (Hooker's).* *l.* closely set, linear, mucronate, and erect, of a pale, slightly glaucous tint. *cones* ovoid-cylindrical, 1½in. to 2in. long, ½in. wide, pendent, dark purple, when ripe pale fawn-coloured; scales coriaceous-imbricated; bracts short, persistent. California, 1854. A very graceful tree, thickly branched, and very distinct.

T. Mertensiana (Mertens').* Very similar to *T. canadensis*, distinguished by its shorter, slenderer leaves, more robust and rapid growth, more spreading branches, and deeper, red-coloured bark; and also by the more elongated scales of its cones and the proportionately longer wings of the seeds. *h.* 100ft. to 150ft. California, 1851. SYN. *Abies Mertensiana.*

T. Pattoniana (Patton's).* Californian Hemlock Spruce. *l.* angular, acutish, attenuate at the base, often curved, ½in. to 1in. long. *cones* cylindrical-oblong, 2in. to 3in. long. Sierra Nevada, 1851. Described by Dr. Engleman as "a tall, strictly pyramidal tree, 100ft. to 150ft. high, and 2ft. to rarely 4ft. through, of graceful habit, with slender, pubescent branchlets, and light green foliage." SYN. *Abies Williamsoni.*

T. Roezlii (Roezl's). *l.* scattered, short, slightly twisted, flat above, rounded beneath, green on both surfaces. *cones* about 2in. long, with large, entire, thin scales; seeds deep red, very small, with a large, membranous wing. Branches pendulous. *h.* 50ft. to 60ft. North California. A curious species, with the habit of *Cedrus Deodara.* See Fig. 116. (R. H. 1870, 21.)

T. Sieboldii (Siebold's).* *l.* solitary, somewhat distichous, thickly set on the branches, frequently alternate, flat, slightly linear, obtuse, rarely acute, entire, dark green above, with two white-glaucous bands beneath. *cones* terminal, 1in. long, elliptic, blunt. Branches irregularly spreading, drooping at the ends; branchlets slender, recurved. *h.* 80ft. to 100ft. Japan. SYN. *Abies Tsuga.*

TUBÆFORM. Hollow and dilated at one extremity, like the end of a trumpet.

TUBE. The part of a gamosepalous calyx, or gamopetalous corolla, formed by the union of the edges of the sepals or petals. A staminal Tube is formed from the cohesion of the filaments in monadelphous flowers.

TUBEFLOWER. A common name for **Clerodendron Siphonanthus** (which *see*).

TUBER. A roundish, underground, succulent stem, covered with buds or "eyes," from which new plants or Tubers are produced; *e.g.*, the Potato. A receptacle of vegetable food.

TUBER. *See* **Truffles.**

TUBERCLED. Covered with small warts or excrescences.

TUBERCULE. A term applied to simple roots which acquire a succulent consistency, become reservoirs of vegetable food, and serve for propagating purposes, in consequence of being terminated by a bud. A little tuber.

TUBEROSE. *See* **Polianthes tuberosa.**

TUBER ROOT. A common name for **Asclepias tuberosa** (which *see*).

TUBS. Wooden Tubs are sometimes used for large plants, such as Palms, Oranges, Tree Ferns, &c. It is important that good drainage should be provided, and porous soil used at first, as the roots cannot be examined very readily afterwards. Trees in Tubs will often remain for several years without the soil being renewed, if watering is properly attended to, and an occasional top-dressing is given.

TUCKERMANNIA. A synonym of **Corema** (which *see*).

TULBAGHIA (named after Tulbagh, a Dutch governor at the Cape of Good Hope, who died in 1771). SYN. *Omentaria.* ORD. *Liliaceæ.* About a dozen species have been referred as such to this genus, but Baker

Tulbaghia—*continued.*

accords this rank to nine only. They are mostly greenhouse, rhizomatous, perennial herbs, with a garlic-like odour, inhabiting South and tropical Africa. Flowers numerous, in a terminal umbel, pedicellate; perianth urceolate or nearly salver-shaped, with six sub-equal, spreading lobes; corona rather fleshy at the throat, shorter than the lobes; stamens six; involucral bracts two, scarious, broad; scape simple, leafless. Leaves radical, ligulate, the withered sheath sometimes forming, with the rhizome, an imperfect corm. The species known in gardens are described below. They are interesting subjects when in flower. Sandy loam and peat form the most suitable compost for Tulbaghias. Propagation may be effected by offsets, or by seeds.

T. affinis (related). A form of *T. alliacea.*

T. alliacea (Onion-scented). *fl.*, perianth greenish-purple, five to six lines long; corona obscurely red, fleshy, entire or crenate; umbels four to twelve-flowered; scapes 9in. to 18in. long. June. *l.* five or six, 6in. to 9in. long, two to three lines broad. 1820. (Ref. B. 349.)

T. a. affinis (related). *fl.*, perianth segments half the length of the tube, narrower. *l.* 1ft. or more long, three to six lines broad. Altogether a more robust plant than the type. SYN. *T. affinis.*

T. a. Ludwigiana (Ludwig's). *fl.*, scape 1½ft. to 2ft. long. *l.* lorate, 6in. to 8in. long, eight to nine lines broad. SYN. *T. Ludwigiana* (B. M. 3547).

T. alliacea (Onion-like), of Sims. A synonym of *T. capensis.*

T. capensis (Cape). *fl.*, perianth greenish-purple, the segments half the length of the tube; staminodia obscurely purple, deeply emarginate; umbels six to eight-flowered; scapes 1½ft. to 2ft. high. June. *l.* ten to twelve, 1ft. or more long, four to six lines broad. 1774. (B. M. 806, under name of *T. alliacea.*)

T. Ludwigiana (Ludwig's). A form of *T. alliacea.*

T. violacea (violet). *fl.*, perianth purplish-violet, eight to nine lines long, the segments lanceolate, half the length of the cylindrical tube; staminodia ligulate, emarginate; umbels eight to twenty-flowered; scapes 1ft. to 2ft. long. March. *l.* six to ten, green, 8in. to 12in. long, two to three lines broad. 1838. (B. M. 3555.)

TULIP. *See* **Tulipa.**

TULIPA (the Italian rendering of the Turkish *tulbend*, a turban, which the flower resembles). Dalmatian Cap; Tulip. Including *Orithyia.* ORD. *Liliaceæ.* A genus comprising, according to Mr. Baker, upwards of sixty species of very beautiful, hardy, bulbous plants, inhabiting Europe, North Africa, Western and Central Asia, and extending as far as Japan. Flowers erect or very rarely nodding, showy; perianth deciduous, campanulate or nearly funnel-shaped; segments distinct, erect or erecto-patent, sub-equal, often spotted inside near the base; stamens six, hypogynous, shorter than the perianth; filaments more or less complanate, attenuated or shortly filiform at apex; anthers oblong-linear, erect, the cells laterally dehiscing. Leaves linear or rather broad. Stem simple, few-leaved, one, or rarely two or three, flowered. Bulb tunicated, the tunics sometimes woolly within. "In the middle of the seventeenth century, Tulips became the object of a trade such as is not to be met with again in the history of commerce, and by which their price rose above that of the most precious metals. It is a mistake, however, to suppose that the high prices paid for bulbs—amounting, in some instances, to 2,500 and even 4,600 florins—represented the estimated value of a root, since these large sums often changed hands without any transfer of property. Bulbs were bought and sold without being seen—without even being in existence. In fact, they were the subject of a speculation not unlike that of railway scrip in this country at no very distant date" (Lindley and Moore). Tulips still take front rank amongst the most familiar and beautiful of hardy, bulbous plants. Many hundreds of varieties have been raised by means of careful hybridisation; and they are mostly offered at prices that place them within the reach of the average amateur gardener.

Propagation. New varieties of Tulips are obtained

Tulipa—*continued.*

from seeds, and some of the species which increase but slowly by offsets may be similarly raised. The most general method of propagation for perpetuating varieties is that of offsets, which are generally produced in fair quantities. Seeds may be sown in boxes of light, sandy soil, about February, and placed in a cold frame, where they will germinate in due course, and may be protected during the following winter. The next season the young bulbs should be planted in a prepared bed outside, for growing on into a flowering size. This takes four or five years, and the first flowers which appear are usually self-coloured; after another period, the length of which is quite an uncertainty, these flowers, which at the first are called "breeders," break into other colours and markings, which admit of their being placed into one or another of the several classes adopted. The process of raising flowering bulbs of Tulips from seed is, therefore, a very slow one. Offsets may be detached from established bulbs, when they are lifted, and grown by themselves until large enough for flowering. The chief supplies of Tulips are imported from Holland, where, —with other, commonly called, Dutch bulbs—they are grown in immense quantities for exportation to all parts of the world. When young seedlings and offsets are raised in gardens, they should be planted in a border or bed prepared with sandy loam, leaf mould, and light manure, and provided with efficient drainage, which, if possible, should be secured by selecting a position where the subsoil is gravelly. A situation exposed to sun and air is preferable, but sheltered from rough winds, which blow the plants about, and break their leaves.

Cultivation. Planting of all kinds of Tulips is best performed in October, and early in November; the bulbs should be placed from 3in. to 4in. deep, to preserve them against injury from severe frost; a little sand round each is generally recommended, but in light, sandy soil this need not be considered absolutely essential—except, perhaps, with scarce sorts or valuable seedlings. Planting with a trowel is best, as the soil is better adapted for the roots to enter than when a dibber is used. A distance of 6in. between the bulbs is sufficient; but when there are not many to be planted they may be more widely disposed. In the spring, so soon as the flowers begin to expand, a light awning placed over the bed will preserve those of any particular variety for a longer period than if they were exposed; but flower-beds filled with Tulips for a spring display cannot receive such attention. The bulbs may be lifted after the foliage turns brown and the stalks become limp, and placed in a cool, airy place, not in the sun. When thoroughly ripened, they may be stored in drawers or bags, where provision can be made for air circulating amongst them, until planting time again arrives. If it becomes necessary to lift the bulbs to clear flower-beds for summer occupants, they should be planted again in reserve beds, and allowed to ripen there.

The arrangement of colours, and the selecting of showy varieties which flower at about the same period, are matters of great importance in planting beds of Tulips. Both single and double kinds succeed admirably, but preference must be accorded the former, which are very distinct and beautiful

For pot-culture and forcing, Tulips—at least, the early-flowering varieties—are invaluable. So soon as the annual consignments arrive from Holland, the supply for the season should be procured, and a portion potted. From three to five bulbs, according to size, are requisite for a 5in. pot, and a compost of two parts loam to one of light manure, with some sand intermixed, is suitable. Afterwards plunge the pots in ashes or cocoa-nut fibre outside, and introduce into gentle heat when the bulbs are well rooted, and begin to push their shoots. Successional supplies should be similarly treated, according to requirements, and the quantity of bulbs at command.

Tulipa—*continued.*

The species here described are those best known in gardens, and are based on Mr. Baker's admirable monograph of the genus, which appeared in the "Gardeners' Chronicle" for 1883. His synopsis of the species, adjusted to the requirements of this work, is given below.

Sub-genus I. Tulipa proper.

Ovary with a sessile stigma.

SECTION 1. ERIOBULBÆ. Perianth bright red; filaments without a tuft of hairs at the base. Lower leaf usually oblong-lanceolate. Outer bulb coats densely coated inside with soft, intertangled, cottony hairs.

maleolens
montana
Oculus-solis
præcox

SECTION 2. CLUSIANÆ (type, *T. Clusiana*). Flowers mainly white, between funnel-shaped and campanulate; filaments without a tuft of hairs at the base. Leaves narrow and grass-like. Outer bulb coats densely hairy inside.

Clusiana
stellata

SECTION 3. GESNERIANÆ (type, *T. Gesneriana*). Perianth usually bright red, campanulate; filaments without a tuft of hairs at the base. Lower leaf broad, with two or three exceptions. Bulb coats glabrous, or with only a few adpressed hairs inside. This is the largest section of the genus, and the one to which all the species most valuable for garden purposes belong. It may be best divided into groups by characters derived from the shape of the perianth segments and the vestiture of the peduncles:

Group 1. Perianth segments all uniform and acuminate.

acuminata
elegans
retroflexa

Group 2. Perianth segments all, or the three outer, oblong, acute; peduncle glabrous.

brachystemon
cruciata
Didieri
Elwesii
Kesselringii
Kolpakowskiana
triphylla
undulatifolia

Group 3. Perianth segments all broadly rounded at the apex, with a small cusp in the centre; peduncle glabrous.

Borsczowi
Gesneriana
macrospeila
Ostrowskiana

Group 4. Perianth segments all narrowed to an acute point.

altaica
Kaufmanniana
strangulata
suaveolens

Group 5. Perianth segments all obtuse; peduncle permanently pubescent.

Alberti
Eichleri
Greigi
iliensis
maculata
pubescens

SECTION 4. SAXATILES. Perianth red or lilac; filaments furnished with a tuft of hairs at the base. These are a little group of fine species, all belonging to the oriental flora, and all, as yet, little known in cultivation.

Aucheriana
Hageri
pulchella
saxatilis

SECTION 5. SYLVESTRES. Perianth always yellow or yellowish-white; filaments with a tuft of hairs at the base. The species of this section have been comparatively little cultivated, and are of much less interest from a horticultural point of view than those of any of the foregoing. They may be divided into three groups by the colour of the flower:

Group 1. Flowers bright yellow, flushed with green on the outside.

Biebersteiniana
fragrans
Grisebachiana
sylvestris

Tulipa—*continued.*

Group 2. Perianth bright yellow, flushed with red on the outside.

australis
humilis
Orphanidea

Group 3. Perianth pale yellow or whitish inside, tinged with green or reddish outside.

biflora
patens
primulina
turkestanica

Sub-genus II. Orithyia.

Ovary narrowed gradually into a distinct style, which is tipped with three small stigmas. The species of thus sub-genus are all dwarf, small-flowered, fragile plants, of little horticultural interest, natives of Siberia, China, and Japan. They may be arranged in three groups, according to leafage:

Group 1. Leaves two, sub-opposite, placed about the middle of the stem.

uniflora

Group 2. Leaves three, crowded near the base of the stem.

thianschanica

Group 3. Leaves, two large ones low down on the stem, and two to four small ones near each flower.

edulis

FIG. 117. TULIPA ACUMINATA, showing Habit and detached Flower.

T. acuminata (acuminate). Turkish Tulip. *fl.*, perianth variable in colour, 3in. to 4in. long, the segments all alike, narrowed gradually into a very long point; peduncle glabrous. April. *l.* (and bulb) as in *T. Gesneriana*. Native country unknown. A distinct type. See Fig. 117. SYN. *T. cornuta* (B. R. 127).

T. Alberti (Albert Regel's). *fl.*, perianth orange-scarlet, the base faintly blotched with red-brown on a yellow groundwork, campanulate, 2in. long, the three inner segments obtuse, the three outer sub-acute; filaments yellow, exceeding the dark purple anthers; peduncle erect, pubescent, 6in. to 9in. long. April. *l.* glaucous-green, lanceolate, without blotches. *h.* 2ft. Central Asia, 1877. (B. M. 6761; R. G. 912.)

T. altaica (Altaian). *fl.*, perianth usually yellow, rarely red, 1in. to 1½in. long in wild specimens, the segments oblong and decidedly acute, without any basal blotch; peduncle pubescent, 3in. to 4in. long. April. *l.* usually three, the lowest lanceolate, about 1in. broad. Stem 6in. to 9in. long. Bulb ⅝in. to 1in. in diameter, the outer tunics without any hairs inside. South-central Siberia. The red-flowered variety is figured in R. G. 942.

T. Aucheriana (Aucher Eloy's). *fl.* strongly fragrant; perianth oblong-infundibular, 1in. to 1¼in. long, all the segments mauve-lilac, nearly alike, oblong, acute, ½in. broad, with a bright yellow claw; stamens ⅔in. long, the yellow filaments twice as long as the anthers, densely hairy at base; peduncle slender, glabrous. April. *l.* three or four, linear, glabrous, acute, 4in. to 6in. long, ½in. broad, gradually narrowed from the middle to the base and apex. Stems 4in. to 8in. long, slender, glabrous, one-headed. Bulb ovoid, medium-sized. Teheran, 1880.

T. australis (Southern).* This is distinguished from *T. sylvestris* by its more funnel-shaped perianth, flushed with red on the outside, 1in. to 1¼in. long, its narrower leaves, and its more slender habit. Savoy. SYNS. *T. Breyniana* (B. M. 717), *T. Celsiana*. *T. humilis* is a dwarf species closely allied to *T. australis;* it is a native of the mountains of Persia.

T. Biebersteiniana (Bieberstein's). This resembles *T. sylvestris*, but the perianth is smaller and more funnel-shaped, and the plant is less robust in habit. Asia Minor, Siberia, &c., 1820.

Tulipa—*continued.*

T. biflora (two-flowered). *fl.*, perianth white inside, with a yellow eye, tinged green outside, oblong, infundibular, the segments oblong, acute; anthers minute. April. *l.* two or three, ¼in. to ½in. broad. Stems 3in. to 6in. long, with often two or three, rarely four or five, flowers. Bulb ovoid, the outer tunics woolly outside. Caucasus, 1806. This is a connecting link between the sub-genus *Orithyia* and the true Tulips. (B. M. 6518; B. R. 535; R. G. 239.)

T. Bonarotiana (Buonarotti's). A form of *T. strangulata.*

T. Borszczowi (Borszczow's). *fl.*, perianth bright red, 1ft. to 1½ft. long, all the segments obovate-oblong, obtuse, with a cusp at the tip, and furnished with a large, brown-black, basal blotch, margined with yellow, as in *T. Oculus-solis*; peduncle glabrous. Spring. *l.* four, with a distinct, cartilaginous, very crisped border, the lower one lanceolate. Dwarfer than *T. Gesneriana*. Central Asia. (R. G. 1175.) The form figured in B. M. 6635 has the flowers yellow without any basal blotch.

FIG. 118. TULIPA GESNERIANA.

T. brachystemon (short-stamened). This is very near *T. Kesselringii*, from which it is said to differ by the flower being smaller with more acute segments, and the leaves being narrower and only two in number. Turkestan. (R. G. 1099, fig. 2.)

T. Breyniana (Breyne's). A synonym of *T. australis.*

T. Celsiana (Cels'). A synonym of *T. australis.*

T. camptopetala (flexible-petaled). A form of *T. Didieri.*

T. Clusiana (Clusius').* Lady Tulip. *fl.*, perianth delicate white, flushed with red on the outside, with a conspicuous, purplish black base, middling-sized; anthers and filaments black. July. *l.* four or five, long-linear, acuminate, channelled. Stem slender, 1ft. to 1½ft. long. Bulb small, densely pilose. Mediterranean region, 1636. (B. M. 1390; S. F. G. 329.)

T. cornuta (horned). A synonym of *T. acuminata.*

Tulipa—*continued.*

T. cruciata (cruciate). *fl.*, perianth bright cherry-red inside, campanulate, 1½in. to 1¾in. long, the outer segments acute, the inner obtuse, both having a large, black blotch with a yellow border filling up the whole claw; stamens black, ½in. long; peduncle obscurely glandular-pubescent. Spring. *l.* four or sometimes five, crowded, spreading, linear; lowest 6in. to 9in. long, ½in. broad. Bulb middle-sized, with a long neck. Asia Minor, 1874.

T. Didieri (Didier's). *fl.*, perianth bright red, campanulate, 2in. to 2½in. long, with a black blotch ½in. to ¾in. long, and having a yellow or whitish border covering the whole of the claw; the three outer segments oblong, acute, the three inner ones more obovate and obtuse; stamens blackish-purple, the anthers equalling in length the glabrous filaments. May. Bulb-coats scarcely hairy inside. Stature, leaves, and peduncle, as in *T. Gesneriana*. Alps. (B. M. 6639.) SYN. *T. Fransoniana*.

T. edulis (edible). *fl.*, perianth pale yellow, sometimes flushed with red, strongly tinged with green on the outside, funnel-shaped, ¾in. to 1in. long, all the segments acute. May and June. *l.*, two lower ones linear, flaccid, 6in. to 12in. long; two below each flower small, linear, erecto-patent. Stem slender, 3in. to 9in. long, one to three-headed. Bulb ovoid, the outer tunics densely woolly inside. Japan.

T. Eichleri (Eichler's).* *fl.*, perianth bright crimson, having a distinct, black blotch spread over the whole claw, with a yellow border; segments obovate, obtuse. April and May. Georgia, 1874. This fine plant closely resembles *T. Gesneriana*, but differs in having a pubescent peduncle. (B. M. 6191; R. G. 799.)

FIG. 119. TULIPA GESNERIANA DRACONTIA, showing Habit and detached Flower.

T. elegans (elegant).* *fl.*, perianth bright red, campanulate, with a yellow eye, the six nearly uniform, oblong segments gradually narrowed to a very acute point; stigma moderately large; peduncle finely downy. End of April. Probably a hybrid between *T. acuminata* and *T. suaveolens*.

T. Elwesii (Elwes'). *fl.*, perianth bright scarlet, erect, campanulate, 1½in. long, all the segments having a small, black blotch with a yellow margin filling up the whole claw, the three outer ones oblong, acute, the three inner ones obovate; stamens dark purple; peduncle erect, glabrous. Early in April. *l.* three, rather glaucous, glabrous; lowest lanceolate, 5in. to 6in. long, ½in. to ¾in. broad, concave down the face above; two upper much smaller, linear. Stem slender, 6in. to 8in. long. Bulb ovoid, ½in. in diameter; tunics dark brown, glabrous inside. Teheran. (R. G. 1147.)

T. fragrans (fragrant). A synonym of *T. sylvestris*.

T. Fransoniana (Franson's). A synonym of *T. Didieri*.

T. fulgens (brilliant). A form of *T. Gesneriana*.

T. Gesneriana (Gesner's).* *fl.*, perianth large, campanulate, the segments variable in colour, when bright red having only an obscure basal blotch, broadly rounded at the apex; stigmas crisped, ½in. in diameter; peduncle glabrous, erect. May and June. *l.* (in a wild state) three or four (often more numerous when growing vigorously under cultivation), broad. Bulb large, the outer coats having a few adpressed hairs on the inside. *h.* 2ft. Levant, &c., 1577. "This is evidently the original stock of most of the late-flowering garden forms" (Baker). See Fig. 118. (B. R. xxiv. 46; F. & P. 537, under name of *T. G. Strangwaysii*.) SYN. *T. Schrenki* (B. M. 6439). *T. fulgens* is a form having bright scarlet flowers with a yellow eye and yellow stamens. The variable race of Parrot Tulips are referred to *T. G. Dracontia*. See Fig. 119. (F. d. S. 2211, under name of *T. turcica*.)

T. G. spathulata (spathulate).* This differs from the type in its larger flowers, of a brilliant-red colour, with a large, purplish-black botch at the base of each of the segments. Italy. Probably the largest of all the wild Tulips. SYN. *T. spathulata*. This is catalogued by many bulb-growers as *T. G. vera*.

T. G. Strangwaysii (Strangways'). A synonym of *T. Gesneriana*.

T. G. vera. *See* **T. G. spathulata.**

Tulipa—*continued.*

An enormous number of garden forms, both double and single, varying most widely in colour, have originated from *T. Gesneriana*. See Figs. 120, 121, 122, and 123.

FIG. 120. FLOWERS OF TULIPA GESNERIANA FLAMANDE.

FIG. 121. TULIPA GESNERIANA FLORE-PLENO, showing Habit and detached Flower.

FIG. 122. TULIPA GESNERIANA GRAND PIED, showing Habit and detached Flower.

T. Greigi (Greig's).* *fl.*, perianth bright flame-red, campanulate, 2½in. to 3in. long, all the segments very obtuse and furnished with a very distinct, linear-oblong, black blotch, sometimes 1in.

Tulipa—*continued.*

FIG. 123. TULIPA GESNERIANA HATIVE, showing Habit and detached Flower.

long, with a yellow border; stigma large; anthers bright yellow; peduncle pubescent. April. *l.* broad-oblong, glaucous, with numerous distinct, brown blotches. *h.* 9in. Turkestan, 1873. A showy and robust species. See Fig. 124. (B. M. 6177; F. d. S. 2261; F. & P. 1876, 217; R. G. 773.)

FIG. 124. TULIPA GREIGI, showing Habit and detached Perianth Segments.

T. Grisebachiana (Grisebach's). *fl.* faintly scented; perianth of a lemon-yellow colour, less than 2in. long; peduncle 1ft. long, one-flowered, glaucous. Spring. *l.* three, very glaucous, erect, 6in. to 7in. long, ½in. to ⅔in. broad, concave. Bulb ovoid, the outer tunics brown, glabrous. Herzegovina, 1884. Closely allied to *T. sylvestris.*

T. Hageri (Hager's). *fl.*, perianth campanulate, 1½in. to 2in. long, the segments bright red, often tinged with yellow outside, oblong, acute, ½in. to ⅔in. broad, furnished with a large, rhomboid, blue-black blotch on the claw, with a yellow border; stamens purplish-black, under 1in. long; filaments densely pilose at base; peduncle glabrous, stiffly erect. April. *l.* three or four, linear, green, acute, channelled down the face, the lowest 6in. to 8in. long, ½in. broad. Stem one-headed, 1ft. long. Bulb ovoid, middle-sized. Attica, 1874. (B. H. 1877, 2; B. M. 6242; R. G. 790.)

T. humilis. *See* **T. australis.**

T. iliensis (Trojan). Cowslip-scented Tulip. *fl.*, perianth lemon-yellow, not more than 1in. long, all the segments obtuse; stigma minute; filaments twice as long as the yellow anthers; peduncle slender, pilose. Spring. *l.* four, linear, aggregated near the base of the peduncle, all under ½in. broad. Bulb small, ovoid, the outer tunics slightly pilose inside. Central Asia, 1879. (B. M. 6518, B; R. G. 975, 982.)

Tulipa—*continued.*

T. Kaufmanniana (Kaufmann's). *fl.*, perianth bright yellow, slightly tinted with red outside towards the top, nearly 3in. long; the segments oblong, acute, without any basal blotch; peduncle erect, downy, 5in. to 6in. long. Spring. *l.* three, glaucous; the lowest oblong-lanceolate, 1½in. to 2in. broad. Stature of *T. Gesneriana.* Central Asia, 1877. (B. M. 6887; R. G. 906, figs. 6-10.)

T. K. albo-variegata (white-variegated). *fl.*, perianth white inside, yellow towards the base, with the back of the three outer segments rose-coloured and white-margined. 1877.

T. K. luteo-variegata (yellow-variegated). *fl.*, perianth pale yellow inside, with a red spot below the middle, the three outer segments rose-coloured on the back, with yellow margins. 1877.

T. Kesselringii (Kesselring's). *fl.*, perianth bright yellow, oblong, 1½in. to 2in. long, the six segments all oblong and sub-acute, the three outer flushed with red down the back; stamens bright yellow; peduncle obscurely puberulent. April. *l.* four, linear, channelled, glabrous, not undulated, the lowest 6in. long. Dwarfer than *T. Gesneriana*, with a smaller bulb, the outer tunics of which are slightly rugose inside. Turkestan, 1879. (B. M. 6754; R. G. 964.)

T. Kolpakowskiana (Kolpakowski's). *fl.*, perianth faintly scented, campanulate, 2in. to 2½in. long, all the six segments varying from bright scarlet to bright yellow, when red having only a small, black-yellow blotch at the base without any distinct border, oblong, acute, the three outer ones spreading away from the three inner; filaments in the red-flowered form glabrous, shorter than the dark purple anthers; peduncle 6in. to 9in. long, obscurely pubescent. April. *l.* three or four, lanceolate, the lower 1ft. long, with a minutely ciliated margin. *h.* 2ft. Central Asia, 1577. A fine species. (B. M. 6710; G. C. n. s., xiii., p. 652; R. G. 951.)

T. macrospeila (broad-stained).* *fl.*, perianth bright crimson, campanulate, 2½in. to 3in. long, all the six segments decidedly obtuse, 1½in. to 1½in. broad, having a large, distinct, nearly black, cuneate blotch, with a broad, yellowish-white border, filling up the whole claw; stamens black, one-third the length of the perianth; stigmas ½in. in diameter, much crisped; peduncle glabrous. May. Habit of *T. Gesneriana.* Origin unknown; probably a hybrid between *T. Gesneriana* and some other species.

T. maculata (spotted). A well-marked, garden race, with the habit of *T. Gesneriana*, from which it differs by its bright red perianth segments, with a broad, black basal blotch, small stigma, and pubescent peduncle. End of May.

T. maleolens (strong-smelling). This "agrees with *T. Oculus-solis* in bulb, leaves, stature, and peduncle; but the black blotch at the base of the perianth segments covers the whole claw" (Baker). The flowers have a faint, unpleasant scent. Italy, 1827. (B. R. 1839, 66.) *variegata* is a variegated form. (S. B. F. G. ser. ii. 153.)

T. montana (mountain-loving). *fl.*, perianth bright red, erect, 1½in. to 2in. long, with oblong, acute outer, and often obovate, obtuse inner, segments, with a very distinct, black basal blotch; peduncle glabrous. July. *l.* three or rarely four, often curved and much crisped at the edges; lowest at most 6in. long, and about 1in. broad. Stems about 6in. long. Bulb large, ovoid. Persia, &c., 1826. (B. R. 1106.) There are several varieties of this species, exhibiting marked differences in the colour of the flowers.

T. neglecta (neglected). A form of *T. strangulata.*

T. Oculus-solis (sun's-eye).* *fl.* scentless; perianth 2½in. to 3in. long; segments bright red, having a great, oblanceolate, black blotch, 1in. or more long, with a yellow border, in the centre of the base. April. *l.* three or four; lowest 1ft. long when fully developed, 1½in. broad. Stem 1ft. to 1½ft. high. South of France, 1816.

T. Orphanidea (Orphanides'). *fl.*, perianth bright yellow, 2in. to 3in. long, the acute segments tinged with red on the outside; anthers oblong, ¼in. long; peduncle long, one-headed. May. *l.* three, linear, channelled. Stem 1ft. to 2ft. long. Mountains of Greece, 1862. (B. M. 6310; R. G. 373.)

T. Ostrowskiana (Ostrowski's). *fl.*, perianth bright red, 2in. or more in diameter, each of the segments having a black spot at the base; filaments very short, dilated, and, as well as the anthers, purple. Spring. *l.* linear-lanceolate, glaucescent. Turkestan, 1884. Closely allied to *T. Oculus-solis.* (B. M. 6895; R. G. 1144, figs. 1, 2.)

T. patens (spreading). *fl.*, perianth whitish, oblong-infundibular, ⅔in. to 1in. long, with a yellow eye inside, tinged green outside; stamens half as long as the perianth. April. *l.* two or three, ¼in. to ½in. broad. Stems 3in. to 9in. long, usually one, rarely two, flowered. Bulb-tunics obscurely pilose inside upwards. Central Siberia, 1817. SYNS. *T. sylvestris tricolor* (R. G. 827), *T. tricolor* (B. M. 3887).

T. præcox (early).* This "cannot b regarded as distinct specifically in a broad sense from *T. Oculus-solis*, from which it differs in its more robust habit of growth, earlier flowering, and ovate, more imbricated perianth segments, with a less clearly marked basal blotch" (Baker). Italy, 1825. (S. B. F. G.

Tulipa—*continued.*

157; B. R. 380, under name of *T. Gesneriana;* B. R. 204, 1143, 1419, under name of *T. Oculus-solis.*)

T. primulina (Primrose-like). *fl.* strongly scented; perianth pale primrose-yellow, funnel-shaped, 1in. long; outer segments lanceolate, tinged with bright red all over the back; inner oblong; peduncle glabrous, 2in. to 3in. long. Spring. *l.* four to six, crowded near the surface of the ground, linear, green, glabrous, channelled down the face, the outer ones 3in. to 4in. long. Stem less than 6in. above the surface, one-flowered. Bulb ovoid, 1in. thick, with bright red-brown outer tunics. Eastern Algeria, 1882. (B. M. 6786.)

T. pubescens (downy).* *fl.* faintly scented; perianth widely varying in colour. This is probably a hybrid between *T. Gesneriana* and *T. suaveolens.* It has the large stigma and six obtuse segments of the former, and the downy peduncle of the latter; the bright red forms have no blotch at the base of the perianth segments. (S. B. F. G. 78; B. M. 2388, under name of *T. suaveolens latifolia.*) To this belong several of the April-flowering garden races, such as BRIDE OF HAARLEM, DUKE OF YORK, and POTTEBAKKER.

T. pulchella (pretty). *fl.*, perianth funnel-shaped, 1½in. long; segments mauve-red in the upper two-thirds, nearly uniform, oblong, acute, the claw slate-violet, with a yellow base; filaments whitish, densely pilose at base; peduncle slender, glabrous, 1in. to 2in. long. April. *l.* three, crowded near the surface of the ground, green, channelled down the face, obscurely ciliated; outer one about 3in. long and ½in. broad, the inner ones narrower. Bulb ovoid, 1in. in diameter; outer tunics rigid, dark chestnut-brown. Cilician Taurus, 1877. (B. M. 6304.)

T. retroflexa (retroflexed).* *fl.*, perianth bright yellow, about 3in. long, with six uniform, oblong segments, narrowed gradually to an acute point; stamens yellow. Early in May. A garden plant, probably a hybrid between *T. acuminata* and *T. Gesneriana.*

T. saxatilis (rock-loving). *fl.* faintly Primrose-scented; perianth oblong-infundibular, 2in. to 2½in. long; segments bright mauve-purple in the upper two-thirds, and bright yellow on the claw, without any spot, the inner ones obovate-cuspidate, 1¼in. broad, the outer oblong, less than 1in. broad; stamens nearly 1in. long; filaments bright yellow, twice the length of the blackish anthers; peduncle glabrous. March. *l.* three or four, lanceolate or linear, glabrous, the lowest above 1ft. long, 1in. to 1½in. broad. Stems 1ft. or more long, often two-headed. Bulb medium-sized, ovoid. Crete, 1827. (B. M. 6374.)

T. Schrenki (Schrenk's). A synonym of *T. Gesneriana.*

T. spathulata (spathulate). A synonym of *T. Gesneriana spathulata.*

T. stellata (star-like). A near ally of *T. Clusiana,* with similar leaves and habit, but the perianth segments are more obtuse, and without the distinct purplish-black eye. February. Himalayas, 1827. (B. M. 2672.) There is a bright yellow variety, with the flower sometimes self-coloured, sometimes flushed with red on the outside.

T. strangulata (constricted). *fl.*, perianth segments furnished at the base with a large, black blotch, both in the typical red-flowered form, and also in some of the yellow varieties. April. This is very like *T. suaveolens,* but much taller. *T. Bonarotiana, T. neglecta,* and *T. vario-picta* are doubtless mere colour varieties. Four of the forms are figured in B. R. 1990, under name of *T. scabriscapa.*

FIG. 125. TULIPA SUAVEOLENS, showing Habit and detached Flower.

T. suaveolens (sweet-smelling).* Van Thol Tulip. *fl.* fragrant; perianth red and yellow, large, with six equal, oblong, acute segments; stigma large; peduncle very downy. March and April. *l.* broad. *h.* 6in. South Europe, 1603. See Fig. 125. (B. M. 839; F. d. S. 1223.) Mr. Baker regards this as the original stock of many of our early-flowering garden forms.

T. s. latifolia (broad-leaved). A synonym of *T. pubescens.*

T. sylvestris (sylvan).* Wild Tulip. *fl.* fragrant; perianth bright yellow, 2in. long, the segments elliptic-lanceolate; filaments woolly at base. April and May. *l.* few, 6in. to 10in. long, linear, ½in. to 1in. broad, glaucous. Stem 1ft. to 2ft. long, terete, flexuous. Bulb small, ovoid, stoloniferous; scales chestnut-brown. Europe (Britain). See Fig. 126. (B. M. 1202; Sy. En. B. 1520.) SYN. *T. fragrans.* Forms with two-flowered peduncles are not uncommon in cultivation.

FIG. 126. TULIPA SYLVESTRIS, showing Habit and detached Flower.

T. s. tricolor (three-coloured). A synonym of *T. patens.*

T. thianschanica (Thians-chan). *fl.*, perianth segments ob-ovate-oblong, obtusely or minutely apiculate, less than 1in. in length; peduncle glabrous, much shorter than the leaves. *l.* three, linear-lanceolate, falcate, minutely denticulate on the edge. Bulb having its outer tunics strigose towards the tip. Thian-schan Mountains.

T. tricolor (three-coloured). A synonym of *T. patens.*

T. triphylla (three-leaved). *fl.*, perianth bright lemon-yellow inside, tinged with green outside, rather funnel-shaped, erect, 1in. to 1½in. long, the outer segments oblong and sub-acute, the three inner more obtuse; stamens less than ½in. long; peduncle glabrous, very slender. March. *l.* three or four, crowded near the base of the peduncle, falcate, linear, 3in. to 4in. long, ½in. to ¾in. broad. Bulb small, with a few hairs inside the outer tunics. *h.* 6in. to 8in. Central Asia. (B. M. 6459; R. G. 942.)

T. t. Hoeltzeri (Hoeltzer's). *fl.* small; perianth yellow, the three outer segments purplish. *l.* linear-oblong, glaucous, undulated, lying on the ground. Turkestan, 1884. (R. G. 1144, figs. 3, 4 a-b.)

T. turcica (Turkish). A synonym of *T. Gesneriana Dracontia.*

T. turkestanica (Turkestan). *fl.* one to six. *l.* two, falcate, lanceolate. Bulb small, ovoid, the outer tunics densely hairy inside. Chiva. A near ally of *T. biflora,* from which it mainly differs in the long cusps of the valves of its capsule. (R. G. 1050, fig. 2.)

T. undulatifolia (undulated-leaved). *fl.*, perianth bright crimson-red inside, greenish-red outside, campanulate, 1½in. to 2in. long, the uniform segments gradually narrowed to an acute point, a black blotch with a yellow border covering the whole claw; stamens ½in. long, with black filaments and very small anthers; peduncle glabrous or pubescent. May. *l.* three, glaucous, lowest lanceolate, 6in. long, 1in. broad, with a concave face and undulated margins. Stems 6in. to 9in. long. Smyrna, 1877. (B. M. 6308.) There is a form with less acute perianth segments.

T. uniflora (one-flowered). *fl.*, perianth segments pale yellow inside, oblanceolate, obtuse, ¾in. to 1in. long, the three outer strongly tinged with green on the outside and spreading in the expanded flower; peduncle erect. April. Stem slender, one-flowered, with a couple of spreading, lanceolate leaves from its middle. Bulb small, ovoid, with brown, membranous tunics produced far above its neck. Altai Mountains. SYN. *Orithyia uniflora* (R. G. 906, figs. 2-5; S. B. F. G. ser. ii. 336).

T. vario-picta (variously-painted). A form of *T. strangulata.*

VARIETIES. Subjoined are selections from the most showy and generally useful varieties that are adapted for pot-culture and, with very few exceptions, for planting in outside beds.

Single Early-flowering and Bedding Tulips. ARTUS, brilliant dark scarlet, very handsome and effective, large. BACCHUS, rich dark crimson; splendid bedding variety. BELLE ALLIANCE, crimson-scarlet; dwarf, early, and lasts long. CANARY BIRD, clear rich yellow; early. CHRYSOLORA, deep yellow, large, handsome; one of the best. COTTAGE MAID, rose-pink and white, flaked, very pretty. COULEUR CARDINAL, crimson-scarlet, very showy and effective, extra fine. CRIMSON KING, bright crimson, very showy. DUC VAN THOL (scarlet), very early, and one of the best for early forcing. JOOST VAN VONDEL, crimson, flaked with white, magnificent. KEIZERS-KROON, intense scarlet, bordered with yellow, immense; a splendid variety, which lasts long in perfection. LAC VAN RIIYN,

Tulipa—*continued.*

dark violet, silvery-white margin. LE MATELAS, deep rose, flushed white, very beautiful; excellent for forcing. L'IMMACULÉE, white; very early, good for forcing. PAUL POTTER, beautiful rose-magenta, distinct and fine. POTTEBAKKER WHITE, pure white, large, handsome; early. PRINCESS MARIANNE, creamy-white, large, handsome. PROSERPINE, rosy-carmine, very large, handsome; one of the best. QUEEN VICTORIA, rosy-white; good bedder. ROSE APPLATI, rose, very large, handsome. ROSE GRIS-DE-LIN, rose, shaded with white, very fine. ROSE LUISANTE, fine, deep rose; splendid forcing variety. ROYAL STANDARD, white, feathered with rosy-crimson, showy. THOMAS MOORE, orange-scarlet, very pretty, and quite distinct. VAN DER NEER, rich violet, very handsome, extra. VERMILION BRILLIANT, dazzling scarlet; good forcing variety, very early. WOUVERMAN, violet-purple, large. YELLOW PRINCE, golden-yellow; fine for forcing, very sweet-scented.

Double Early-flowering and Bedding Tulips. COURONNE DES ROSES, shaded rose, very fine and handsome. CRAMOISE SUPERBE, crimson; fine bedder. DUKE OF YORK, deep rose, edged with white, showy and effective; late-flowering. GLORIA SOLIS, orange-crimson, deeply edged with golden-yellow. IMPERATOR RUBRORUM, crimson-scarlet, extra fine. LA CANDEUR, white, very double, fine; rather late-flowering. LEONARDO DA VINCI, crimson-edged, golden-yellow, very fine. MURILLO, rosy-white; excellent for forcing. PÆONY GOLD, golden-yellow, feathered crimson, fine; rather late. PRINCESS ALEXANDRA, crimson, edged with golden-yellow, fine. PURPLE CROWN, rich purplish-crimson, very large and effective; rather late. REX RUBRORUM, brilliant crimson-scarlet; highly effective in beds; rather late. ROSINE, rosy-pink; fine for bedding. SALVATOR ROSA, dark rose; one of the best double rose varieties. TOURNESOL, scarlet, edged with yellow, large and handsome; the best double variety for forcing. TOURNESOL YELLOW, yellow, suffused reddish-orange, large. YELLOW ROSE, bright golden-yellow; late-flowering.

Parrot Tulips. These are very effective in borders and shrubberies, but are not adapted for pot-culture. They produce large, brilliantly-coloured flowers. Amongst the best are: ADMIRAL DE CONSTANTINOPLE, red, tipped with yellow; FEU BRILLANT, crimson; LUTEO MAJOR, yellow, slightly striped crimson and green; MARK GRAAF, yellow, striped scarlet and green; MONSTRE ROUGE, crimson, large; PERFECTA, yellow, scarlet, and green.

TULIP, AFRICAN. A common name for **Hæmanthus** (which *see*).

TULIP-BEARING MYRTLE. *See* **Darwinia macrostegia.**

TULIP, BUTTERFLY. A popular name for **Calochortus lilacinus** (which *see*).

TULIP, DROOPING. A common name for **Fritillaria Meleagris** (which *see*).

TULIP, GOLDEN STAR. A common name for **Calochortus pulchellus** (which *see*).

TULIP-TREE. *See* **Liriodendron tulipifera.**

TULIP-TREE, LAUREL-LEAVED. A popular name for **Magnolia** (which *see*).

TULIP, WILD, OF CALIFORNIA. A common name for the genus **Calochortus** (which *see*).

TUMBOA. A synonym of **Welwitschia** (which *see*).

TUMID. Swollen.

TUNGA. A synonym of **Hypolytrum** (which *see*).

TUNHOOF. A common name for **Nepeta Glechoma** (which *see*).

TUNIC. A coat; a seed cover.

TUNICA (from *tunica*, a coat; in reference to the overlapping of the floral envelopes). ORD. *Caryophylleæ*. A genus embracing about half-a-score species of hardy, annual or perennial herbs, natives of mostly Southern Europe and Western Asia. Flowers smaller than those of *Dianthus*, cymose-paniculate, glomerate, or capitate; calyx obtusely five-toothed; petals five, with elongated claws, and retuse or emarginately bifid blades; stamens ten. Leaves narrow. The under-mentioned species thrives in any light soil, and on old walls, ruins, &c. It is also adapted for planting on rockwork, and at the front of mixed borders. Propagated readily from seeds.

Tunica—*continued.*

T. Saxifraga (Saxifrage-like). *fl.*, calyx campanulate, the teeth triangular-ovate; lamina of corolla pink, short, retuse or erose. July. *l.* scabrid, narrow-linear, acute. Stems numerous, ascending or diffuse, paniculate. Central and South Europe. Perennial.

TUNICATED. Having a coat or coats.

TUPA. Included under **Lobelia** (which *see*).

TUPELO-TREE. *See* **Nyssa.**

TUPIDANTHUS (from *tupis, tupidos*, a mallet, and *anthos*, a flower; referring to the shape of the flower buds). ORD. *Araliaceæ*. A monotypic genus. The species is at first a small, glabrous, erect tree, afterwards a lofty climber. It thrives in sandy loam. Propagation may be effected by cuttings, inserted in sand, under a bell glass, in heat.

T. calyptratus (calyptrate). *fl.* green; buds ⅝in. in diameter, nearly globose; stamens fifty to seventy; main umbel about three-rayed, the branches 3in. long, very stout, with large bracts at their bases; partial umbels five to seven-cleft. *l.* digitate; leaflets seven to nine, entire, 7in. by 2½in., narrow-oblong, shortly acuminate, narrowed at base; petiolules 2in. long. India, 1855. (B. M. 4908.)

TUPISTRA (from *tupis*, a mallet; alluding to the peculiar form of the stigma). Mallet Flower. SYN. *Platymetra*. Including *Macrostigma* (of Kunth). ORD. *Liliaceæ*. A genus embracing three or four species of stove, perennial herbs, inhabiting the Himalayas or Burmah. Flowers sessile, clustered; perianth violet or lurid, campanulate, with a broad, scarcely contracted tube, and six, rarely eight, short, spreading, sub-equal lobes; stamens six or eight; spike terminal, dense, cylindrical; scape short or elongated, erect or recurved at apex, simple. Leaves radical, long, ample, contracted into the petioles. Rhizome thick. The two species known in cultivation thrive in rich loam; they may be increased by suckers, or by division of the plants, in spring.

T. macrostigma (Macrostigma). *fl.*, perianth dark purple, ½in. across, campanulate; spike drooping, lax, 2in. to 3in. long; peduncle dark purple, erect, as long as the spike. December. *l.* lanceolate, acute, chartaceous, above 1ft. long, bright green; petioles dilated at base, firm, erect, 6in. or more long. Rhizome creeping, much-branched. Khasia, 1876. (B. M. 6280.) SYN. *Macrostigma tupistroides* (R. G. 192).

T. nutans (nodding). A synonym of *T. squalida*.

T. squalida (squalid). *fl.*, perianth lurid-violet, or with the tube greenish, six to eight lines long; bracts large, scarious, deltoid; spike dense, nodding, 3in. to 6in. long; scape 3in. to 6in. long. March. *l.* oblanceolate, erect, 2ft. to 3ft. long, 2in. to 4in. broad, long-petiolate, narrowed at both ends. Rhizome fleshy. Himalayas, 1820. (B. M. 1655; B. R. 704; L. B. C. 515.) SYN. *T. nutans* (B. M. 3054; B. R. 1223).

TURBINATE. *See* **Top-shaped.**

TURF. A term applied to grass sods which are laid over the surface of ground to form lawns, edgings, verges, &c. Laying or cutting out flower-beds in Turf is a familiar operation. Turf is also cut from fields, and stacked in heaps for decomposing and forming loam, which is in daily request for potting and various other purposes. When used for forming new lawns, &c., that are to be kept mowed, it is most important that the Turf should be as free as possible from weeds, such as Daisies, Plantains, and the like. Pasture land which has long been laid down, and the grass closely eaten off by sheep or deer, is generally the best, as, provided the soil is fairly good, the more grazing or cutting is practised, the more dense does the Turf become at the root, and this is, of course, most favourable to the quick formation of a new lawn. The ground should be first prepared, made thoroughly firm by treading, and raked fine, before the Turf is laid. Autumn, and any favourable weather during winter and early spring, are best suited for the work. A handy size for cutting Turfs, when they are sufficiently tough for rolling, is 3ft. long by 1ft. wide; they are best cut with a turfing-iron, or, what is worked in a similar way, a turf-plough. Small squares (about

Turf—*continued.*

9in.) are readily fitted together, and are often preferable to 3ft. lengths. All the interstices should be filled in with fine soil, swept with a birch broom, and then the whole surface may be rammed or beaten with a turf-beater. It is important to get newly-laid Turf consolidated, and the pieces all fitted together, while the ground is moist. If from any cause Turf should have to be laid late in spring, or during summer, it often becomes dried up, and the pieces separate from each other; the work should not, therefore, be left until those seasons, if it can be avoided. It is of little use watering from the top in summer, but new Turf may be more readily re-established at that season by watering the ground first, and then laying the sods on the top.

TURF-BEATER, or **TURF-BEETLE.** This is used for beating the surface of newly-laid turf, to consolidate and render it level. A Turf-beater may easily

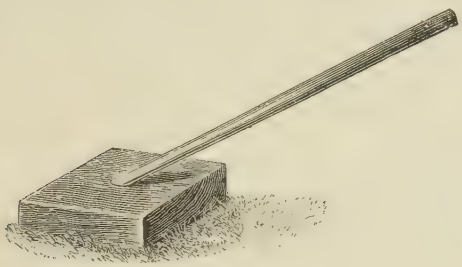

FIG. 127. TURF-BEATER.

be made from a flat, oblong piece of wood 3in. thick. A strong handle should be fixed into the centre of the upper side at an angle sufficiently acute to allow the Beater to be brought down flat on the turf when in use (see Fig. 127).

FIG. 128. TURF-SPADE.

TURF-RASER. A useful implement where a large quantity of turf has to be cut; it is employed for marking out the proper width for cutting in strips, and is used by a person who works in advance of others lifting the turf. A very simple form, but still one which answers most effectually, consists of an ordinary wooden handle with the point of an old scythe fixed into one end of it, at nearly or quite a right angle. This blade cuts into the turf at a uniform depth, and is guided along a line by the workman using it.

TURF-SCRAPER. A Scraper, made of wood or iron, similar to those used for roads, answers equally well for scraping lawns when worm-casts or ant-hillocks abound. A Turf-scraper is not, as a rule, otherwise required.

TURF-SPADE, or **TURFING-IRON.** An implement used for lifting turf that has previously been cut through with an edging-iron or a turf-raser. It has a bent handle, and a heart-shaped, flat blade (see Fig. 128), and is much handier for the purpose than an ordinary spade, as, if properly used, any quantity of turf may be cut of about a uniform thickness.

TURF-WALKS. Walks formed of turf instead of gravel, stones, or other hard substances. They require in formation exactly the same preparation as lawns, with, of course, the width limited. Occasionally, but not very frequently, Turf-walks are introduced into kitchen gardens.

TURGID. Swollen; puffed up.

TURGOSEA. Included under *Crassula.*

TURIO. A scaly sucker, which afterwards becomes a stem, as in Asparagus.

TURKEY CORN. A popular name for **Dicentra formosa** (which *see*).

TURKEY OAK. *See* **Quercus Cerris.**

TURK'S CAP. *See* **Melocactus communis.**

TURK'S HERB. An old name for **Herniaria glabra** (which *see*).

TURMERIC. *See* **Curcuma.**

TURMERIC ROOT. A common name for **Hydrastis canadense** (which *see*).

TURNERA (dedicated by Linnæus to the memory of William Turner, author of a "New Herbal," 1551; he died in 1568). Including *Piriqueta.* ORD. *Turneraceæ.* A genus comprising about seventy species of stove herbs, sub-shrubs, or shrubs, all tropical American, with the exception of one found in South Africa. Flowers yellow, axillary, solitary, rarely racemose or fascicled; calyx five-parted; petals five, inserted in the throat of the calyx; stamens five, inserted below the petals; peduncles free or connate with the petioles. Leaves scattered, entire, serrated, or sub-pinnatifid, often biglandular at base. Most of the Turneras have a weedy aspect, but those here given are rather pretty subjects when in flower. They thrive in any light soil. Propagation may be effected by seeds, which are freely produced; the shrubby species may also be increased by cuttings, inserted under a hand glass, in heat; and the herbaceous perennials either by cuttings or by divisions.

T. trioniflora (Ketmia-flowered). A synonym of *T. ulmifolia elegans.*

T. ulmifolia (Elm-leaved).* West Indian Holly or Sage Rose. *fl.* almost sessile, about the size of those of *Reinwardtia trigynum;* peduncles bibracteate, connate with the petioles. June to September. *l.* oblong, acute, serrated, pubescent above, white-tomentose beneath, biglandular at base. *h.* 2ft. to 4ft. South America, 1733. Perennial herb. See Fig. 129. (B. M. 4137.)

Turnera—*continued.*

T. u. angustifolia (narrow-leaved). *l.* oblong-lanceolate. (B. M. 281, under name of *T. angustifolia.*)

T. u. cuneiformis (wedge-shaped). *fl.*, claws of the petals brownish. *l.* obovate-cuneate, coarsely serrated. *h.* 1ft. to 3ft. Brazil, 1821.

T. u. elegans (elegant). *fl.* sessile, as large as those of the Bladder Ketmia; petals pale yellow or sulphur-coloured, with purplish-brown claws. All the year. *l.* oblong-lanceolate, coarsely serrated, cuneate at base, quite entire, pubescent. *h.* 1ft. to 2ft. Brazil, 1812. SYN. *T. trioniflora* (B. M. 2106).

TURNERACEÆ. A natural order of glabrous or pubescent herbs or shrubs, mostly American, a few being African, and one broadly dispersed over Asia, but not indigenous. Flowers regular, hermaphrodite, axillary, solitary or few, sessile or pedunculate, rarely racemose; calyx tubular, five-cleft, deciduous, the lobes imbricated; petals five, inserted at the throat of the calyx, clawed, membranous, twisted, deciduous, naked or with a scale at the tip of the claw; stamens five, very rarely hypogynous; filaments free, flat-subulate; anthers oblong; ovary free, one-celled; styles three, filiform; peduncles free or connate with the petioles, occasionally jointed, often bibracteolate. Capsule one-celled. Leaves alternate, petiolate, simple or pinnatifid, often argutely serrated, frequently biglandular at base; stipules small or wanting. The order embraces three genera—*Erblichia*, *Turnera*, and *Wormskioldia*—and about seventy-six species.

TURNIP (*Brassica Rapa*). A hardy biennial, native of Europe (Britain), &c.; cultivated from a remote period, for the use of the fleshy roots, which are boiled and served as a vegetable in various ways. The tender growing tops are also gathered in spring, and cooked as a green vegetable; and they are sometimes blanched at the same season as a substitute for Seakale.

Cultivation. The Turnip is chiefly an autumn and winter crop, as it succeeds best in cool, moist weather; but early and successional supplies may be procured by commencing to sow early in spring, and keeping on at intervals until July. In summer, Turnips not unfrequently run to seed without forming roots of a useful size; and during dry weather they are, if procurable, often stringy, and of inferior quality. The destructive Turnip Flea has also to be contended against; all through early summer especially, its attacks are commenced on the seedlings so soon as they appear above ground. It is of little use

Turnip—*continued.*

attempting to force Turnips too early in spring: they should not be sown under glass until the weather is favourable for admitting plenty of air. The first supply may be obtained by sowing some seed broadcast in a frame, during February or early in March. The least bottom heat from fermenting material may be allowed, but a spent hotbed or cold frame, with from 3in. to 6in. of rather fine, light soil in it, will do; an early variety should be selected—Early Munich is one of the best. The seedlings require thinning out so soon as they are large enough to handle. Plenty of air must be allowed, to insure a sturdy growth, and when the leaves get strong the frame may be removed. The season will by this time be advanced and the weather warmer than at the period of seed-sowing. Attention to watering is the principal point in after-cultivation. A valuable supply may be thus obtained in advance of any that could be grown entirely in the open air; a two-light frame at least should be allowed, as it could scarcely be more profitably utilised.

By the middle of March, the first sowing may be made on a south border, and successional sowings according to requirements will be necessary until the end of June or early in July, when the seed for the main crop should be put in. In favoured districts, any time in July will do, and sowings may even be made up till the end of August with successful results. Turnip seed usually grows very freely, and the young plants appear above ground in a very short time. Some cultivators sow broadcast, but the ground is more readily kept free from weeds and the plants thinned out when the plan of having drills is adopted: the latter is therefore recommended. Drills 1ft. apart will suffice; they should be drawn with a hoe not more than 2in. deep, and the plants may be thinned to about 9in. apart, though this distance may vary somewhat according to the strength of the variety and the season. During summer a cool situation is preferable, and in dry weather it is often necessary to keep Turnips watered. If this is not done, growth becomes checked, and either the plants run to seed or the roots lose their succulent nature and become pithy. The main crop may be left in the ground, to be pulled when required, but for the purpose of having a supply in very severe weather it is advisable to lift a portion, cut off their tops—not too closely—and store them in sand or soil ready for use. The crops at all seasons are much benefited by keeping the soil between

FIG. 129. FLOWERING BRANCH OF TURNERA ULMIFOLIA.

Turnip—*continued.*

hoed and loose on the surface. Damp, dull weather is most favourable for Turnip cultivation; but as the crop is of much importance throughout the season, all that can be done during the summer to counteract the evil influences of drought should receive full attention. If two or three varieties are sown at the same time, sometimes one will thrive if another fails. Turnips succeed best in rich, rather light, loamy soils; ground which is stiff and retentive is not well adapted, as the roots do not attain a good flavour, and in the summer are more apt to run to seed; light, gravelly soils are also unsuitable.

Animal Pests. The animal foes of this valuable plant are both numerous and varied. A large proportion of them attack the roots. Ants are said to carry off the seed, and to endanger the crop at times; and sparrows and other seed-eating birds assist in such depredations. The germinating plants, so soon as they appear above the soil, are too often wholly destroyed by the **Turnip Flea or Fly** (which *see*), and by small Weevils, such as **Otiorhynchus** (which *see*), and *Ceuthorhynchus contractus*, which is nearly related to the Turnip-gall Weevil (*see* **Turnip Galls**) and **Turnip-seed Weevil** (which *see*). The best treatment for the destruction of these insects is mentioned under the above headings.

When the plants are somewhat larger, the leaves are often so eaten by numerous larvæ, that merely the larger veins remain, or, at least, large holes are gnawed in the leaves and other green parts, to the injury of the plants, and the consequent diminution of the root-crop. The larvæ (*see* **Cabbage Caterpillars**) of the White Butterflies (*Pieris Brassicæ*, *P. Napi*, and *P. Rapæ*) feed on the leaves of Turnips, as they do also on Cabbages; and they are assisted in this by the larvæ of various Night-moths, *e.g.*, of **Mamestra** (which *see*), and of **Plusia gamma** (which *see*) and others noted under the headings **Potherb Moths** and **Surface Caterpillars.** The larvæ of a small Moth, **Plutella cruciferarum** (which *see*), are very numerous in some localities, living under webs on the lower surfaces of, and eating holes in, the leaves.

Still more dangerous than the Butterflies and Moths is *Athalia spinarum*, the **Turnip Sawfly** (which *see*), the larvæ of which at times devastate entire fields. An allied species (*A. ancilla*) also proves destructive occasionally, though to a less extent.

Various Beetles assist in destroying the leaves of Turnips, chief among them being the **Turnip Flea** (which *see*); though Curtis accuses **Phaedon Betulæ** (which *see*) and *Otiorhynchus* of aiding in the harm done.

Besides the holes eaten through them, the leaves are often marked with white, wavy tracks, or mines, burrowed between the surface-membranes. These mines are the work of larvæ of small Flies (*Drosophila* and *Phytomyza*), and of the **Turnip Flea** (which *see*). The flowers inclosing the young ovaries are favourite resorts of numerous Beetles, some of which gnaw the various organs, devouring the ovaries, or rendering them unfertile. The flowers and flower-stalks, and, to a less extent, the leaves, are sometimes injured by more than one kind of plant-louse (*see* **Aphides**). The seeds are devoured in the seed-vessels, while soft, by larvæ of certain small Midges belonging to the group of Gall-midges (*Cecidomyidæ*), but these scarcely alter the form of the fruit. The larvæ of the **Turnip-seed Weevil** (which *see*) also devour the seeds in the fruit. From their concealed mode of life, little, if anything, can be done against those insects that feed on the seeds. But, while the green parts, the flowers, and the seeds, are all liable to serious injury from animals, and the roots thus suffer indirectly, the latter parts suffer from direct attacks even more seriously than do the other organs. All herbivorous quadrupeds eat them; and hares and rabbits are

Turnip—*continued.*

peculiarly hurtful where Turnips are grown in an insufficiently inclosed area. Rooks also greatly injure Turnips, by scooping out holes in them to obtain food during snowy weather. In localities near the sea-coast, a similar habit is frequently indulged in by sea-gulls. Among the most effectual protections against birds are threads stretched in zigzags near the soil, and decked with rags, or other fluttering objects, suitable to act as scarecrows.

Some account of the more destructive parasites of Turnip roots is given, along with the most successful remedies against each, under the headings **Slugs, Snails, Surface Caterpillars, Turnip Galls, Turnip Moths,** and **Wireworms**; and it would occupy unnecessary space to repeat what is contained in those articles. When the roots have begun to decay, the change is hastened by numbers of **Millipedes** (which *see*) and insects (chiefly larvæ of small Beetles and Midges) that feed in them, and soon reduce them to the condition of putrescent masses.

In Germany, it has been observed that Turnips and other Crucifers are liable to have the smaller side-roots more or less injured by the production of small, round galls on them, the work of a minute worm (*Heterodera Schachtii*), of which an account is given, and appropriate remedies are discussed, under **Nematoid Worms.**

Fungi. Turnips are liable to serious injury from the attacks of several species of Fungi, most of which have been already discussed in this work under headings quoted below. Almost all of them also infest Cabbages and cruciferous weeds—a circumstance that must be kept in mind in the means employed for preventing or curing diseases caused by them in Turnips. Of those that have proved peculiarly injurious in Great Britain, the more hurtful are the following:

Plasmodiophora Brassicæ (which *see*), producing "Clubroot," or "Finger-and-Toe," in the roots, of which they cause the early death and decay, so that the crop is largely, if not entirely, destroyed in severe attacks.

The leaves are frequently "mildewed." One form of "Mildew" is caused by the growth of the superficial mycelium of *Oidium Balsamii* (*see* **Oidium**), which is itself a young stage of an *Erisyphe* of some kind, of which the perfect condition is uncertain. The thread-like cells of the Fungus spread in a thin, whitish coat over the whole of both surfaces of the leaf, from which they draw their nourishment, without, however, traversing its tissues; and they injure it both by the nourishment they absorb from it, and by hindering free interchange of gases and fluid between the cells of its interior and the air. The leaves wither and dry up, and the plants are insufficiently nourished, with evil effects to the roots. For a remedy, *see* **Oidium.**

Peronospora parasitica gives rise to another form of "Mildew" on the leaves. This shows itself in whitish patches, which consist of erect stalks, much branched above, and bearing on the tips of the branches the nearly globose conidia or reproductive cells. The mycelium of the Fungus burrows among the inner cells of the leaf, and only the stalks just spoken of are seen on the surface, passing out through the stomata. The sexual reproduction of the Fungus is also provided for by the mycelium in the leaves, as described under **Peronospora.** The upper surface of the leaves is mildewed by this Fungus far less frequently than the lower; but the presence of the parasite is shown by yellowish-green or yellow patches on the surface. *P. parasitica* frequently grows in the flower-stalks and in the flowers, which, under its influence, become much distorted and swollen, and fail to produce seeds. All parts in which it grows are liable to premature death and rapid putrefactive decay in moist air. For treatment, *see* **Peronospora.**

White Rust is very often associated with *P. parasitica*, growing on the same spots of the plant, and

Turnip—*continued.*

actually intermingled with it; but frequently, also, they grow apart from one another. The White Rust resembles splashes of whitewash, when the conidia are matured on the diseased spots, which latter are usually swollen and distorted. It occurs on stems, leaves, and flowers. The Fungus (*Cystopus candidus*) is nearly related, in a good many points, to *Peronospora*. For an account of its structure, and of the treatment to be employed against it, *see* **Rust.**

The leaves frequently show spots or patches, often 1in. or more in breadth, at first yellowish, but soon becoming withered and dry. On these spots, the microscope shows minute Fungi. On some, there may be found slender conidia (with many septa, or cross-walls), on the tips of short threads, pushed through the stomata. This form of Fungus has been named *Cercospora Bloxami* by Messrs. Berkeley and Broome. On other spots occur small dark **Pycnidia** (which *see*), in which are produced small, oval, pale sporidia, one-celled (*Phyllosticta Brassicæ*), or two-celled (*Ascochyta Brassicæ*). The relations between the Fungi found on such patches are still very uncertain. Turnips do not suffer very seriously from the presence of these Fungi, as the latter seldom affect the young, vigorous leaves, but prefer the lower leaves when already half-dead. It is, therefore, unnecessary to dwell upon treatment, further than to mention that it is a wise precaution to destroy—if possible, by fire—all leaves overgrown with parasites.

Two other Fungi have been described as occasionally very injurious to Turnips in Germany, and a brief notice of them will not be out of place here. *Polydesmus exitiosus* is the name given by Dr. J. Kühn to a Fungus described by him as extremely injurious to Turnips, destroying both the leaves and the unripe seed-vessels. Very dark spots appear on the diseased organs; the spots spread, and the tissues become discoloured, and dry up. If the seed-vessels are attacked while young, the seeds do not ripen; but if the disease is late in its appearance, they may ripen, but are soon destroyed, the valves of the fruit shrivelling, and bursting away prematurely. In the diseased tissues, the mycelium of a Fungus is present in abundance, absorbing the nourishment in the cells, and destroying the cell contents and cell walls. From this mycelium rise erect branches, which project through the epidermis of the leaf, and bear, on their tips, conidia that vary much in form, but that, when mature, are clavate, being fixed by the broader end, and having the other prolonged as a slender filament; or there may be a series of from five to ten such conidia, end to end, forming a chain. The conidia are dull or brown-violet, and are divided into cells, by numerous cross-walls, and a few longitudinal ones. The conidia readily fall off the erect branches, and germinate speedily, in damp, warm weather, spreading the disease if they fall on green parts of Turnip-plants, under suitable conditions. This Fungus produces brown, withered spots in the parts affected, often surrounded by a yellow or reddish border. On these spots develop **Pycnidia** (which *see*) of *Phyllosticta Brassicæ*, and perithecia of a **Pleospora** (which *see*), perhaps *P. herbarum*. The only treatment possible is to endeavour to prevent future attacks, by destroying diseased parts of plants without delay.

Peziza sclerotiorum is blamed by Dr. Frank as the cause of a peculiar disease of Turnips, which was prevalent, near Leipzig, in 1879. The plants became yellow during July. The cause of this was a diseased state of the stems, commonly near the base, which manifested itself in a pale colour, and in a separation between the epidermis and the tissues below it. On breaking the stem, the pith is found occupied by a black, oval body, the sclerotium, from which the above *Peziza* grows out in the following spring. For an account of the structure

Turnip—*continued.*

of the Fungus, and of the treatment advised against it, *see* **Peziza.**

Sorts. These are very numerous, but it is unnecessary to grow many varieties if attention is given to include those which are adapted for early use, and others for main crops. The shapes and outside colours vary in the different sorts; but this is of little importance, provided the inner flesh is of good quality. The flesh is either white or yellow: white-fleshed varieties are generally preferred in the southern division of the country, while yellow ones are more largely cultivated in the north.

FIG. 130. EARLY STRAP-LEAVED WHITE STONE TURNIP.

CHIRK CASTLE BLACK STONE, skin black; very fine and hardy. EARLY PARIS MARKET, white, oblong in shape; early, a much-esteemed French variety. EARLY PURPLE-TOP MUNICH, distinct and very early; one of the most valuable for frame culture and for early crops, the produce is at its best when about half or three-parts grown. EARLY RED AMERICAN STRAP-LEAVED STONE,

FIG. 131. ORANGE JELLY TURNIP.

Turnip—*continued.*

flesh white and firm; very early. EARLY SNOWBALL, one of the best whites, sweet and tender; early, largely grown for the London markets. EARLY STRAP-LEAVED WHITE STONE, fine quality; suitable for very early and for late sowing (see Fig. 130). EARLY WHITE DUTCH, an old and well-known sort, of excellent quality. EXTRA EARLY MILAN, bulb flattened, with purple top; very early, and compact in habit. ORANGE JELLY, or GOLDEN BALL, an excellent yellow variety (see Fig. 131); much favoured in the north of England and in Scotland. VEITCH'S RED GLOBE, of handsome shape and fine flavour;

FIG. 132. YELLOW MALTA TURNIP.

one of the best for main crop, and for use in winter. YELLOW MALTA, a handsome yellow variety, of good quality, but sometimes rather strong-flavoured (see Fig. 132).

TURNIP, DEVIL'S. A common name for **Bryonia dioica** (which *see*).

TURNIP FLEA, or **TURNIP FLY.** Names commonly given to two or three species of **Phyllotreta** (which *see*). This genus of small Beetles belongs to the large group formerly included under the generic name *Haltica*, but now, for convenience, subdivided, by minute characters, into numerous genera. All the insects in this group have the thighs of the hinder pair of legs thickened, whereby they are enabled to leap several inches. This power and their small size have gained for them the popular name of Fleas, though widely different from true Fleas in many respects. They all feed on plants, several being attached to the *Cruciferæ*. Turnips are often ravaged by *P. nemorum*; and *P. concinna* is also a dangerous foe to these plants in some localities. *P. consobrina* and *P. obscurella* are mentioned by Curtis, in "Farm Insects," as not uncommon on Turnips; and *P. flexuosa* and *P. Lepidii* have been recorded as dangerous in Germany. However, the general appearance and the habits of all are much alike; as are also the remedies that should be employed against their attacks. The general form of the species in the genus is well shown in Fig. 133; but the size varies from

Turnip Flea, or **Turnip Fly**—*continued.*

$\frac{1}{12}$in. to $\frac{1}{8}$in. in length. All have the ground-colour very dark olive-green or metallic-green. *P. nemorum* has a broad ochre-yellow streak down each wing-case (see

FIG. 133. TURNIP FLEA (*Phyllotreta nemorum*), magnified.

Fig. 133); and the legs are rusty-ochre, with pitchy thighs. *P. concinna* is more oval and convex than the former species, and is of a uniform greenish-black, with a shining coppery or brassy lustre — the legs being black, except the rusty-red base of the tibiæ. *P. consobrina*, *P. Lepidii*, and *P. obscurella*, are much like *P. concinna*, the four species differing in the pitting of the surface, in the peculiar shade of the metallic lustre, in the colour of the base of the antennæ, in the proportions of the fourth and fifth joints in these organs, and in size of body, to a slight degree. *P. flexuosa* is more like *P. nemorum*, being black, with a pale clay-yellow line down each wing-cover; but the pale line is narrow and wavy, and the knees are pitchy-black, not reddish; and the fourth and fifth joints of the antennæ are shorter than in *P. nemorum*.

An account of the life-history of the very common species *P. nemorum* may be regarded as fairly representative of the habits of all that attack Turnips; so that the following remarks, though referring primarily to that species, will also, in great measure, be applicable to the others. The Beetles usually pass the winter concealed under rubbish on the soil, *e.g.*, stubble or other dead herbage, clods, &c., though an occasional warm day brings them out of their shelters. In spring, they begin to feed on the cruciferous weeds (Shepherd's Purse, &c.), which are only too plentiful everywhere, alike in cultivated ground and in waste spots. When the cotyledons and first leaves of the seedling Turnips appear above the soil, they form the favourite food of the Beetles, which gnaw away the tissues till little more than the skeletons of the leaves remain, and the plants die in vast numbers. The crops are occasionally ruined; and even second and third sowings are sometimes destroyed in the same way. After the young plants have produced the rough leaves, the danger of serious injury from this cause is comparatively slight; though large holes are gnawed by the insects in the leaves. The female beetles each lay a few white eggs, here and there, on the lower surface of the leaves. In about ten days, the larvæ are hatched. They are pale yellowish maggots, with three pairs of legs in front, and a sucker at the end of the body. They gnaw through the skin of the leaf; and, for about a week burrow in the tissues below it. They then are full-fed, drop to the ground, and burrow from 1in. to 2in. into the soil, to become pupæ. In about a fortnight, the beetles emerge. There may thus be, and usually there are, several broods in a season.

Prevention and Remedies. It is most desirable to clear away all cover that can protect the insects. The ground should be cleared of all cruciferous weeds, such as supply the insects with food before the appearance of the Turnip crop. Digging and ploughing the soil in winter destroys many of the Beetles, by burying them too deeply to allow of their return to the surface.

It should be kept in mind that the dangerous period to the crop is while the seedlings are quite young, and that the danger is very much less when the plants have formed the rough leaves; consequently, whatever strengthens

Turnip Flea, or Turnip Fly—*continued.*

the plants, and shortens the duration of the dangerous period, is a valuable means of preventing harm. It is, therefore, of great importance to have the soil thoroughly prepared before the seed is sown, as well as to give a good supply of manures, such as phosphates and nitrogenous manures, and also to water the plants in dry weather. It has been suggested that thick sowing (up to 10lb. of seed per acre) will give a better prospect of escape from complete loss by the Turnip Flea; but this is not advisable, as overcrowding is apt to render the plants weak, and to prolong the period of danger from the Beetles, as well as to do harm in other ways.

A method sometimes employed to protect Swedish Turnips, is to mix the seed with one-third of its weight of the seed of common Turnips, the young plants of which are preferred by the insects.

Should the crops be attacked, the injury may be lessened, even though a cure should not be effected, by one or other of the following methods: A light, shallow tray may be tarred inside, and dragged over the rows of Turnips, having something at such a distance in front as to disturb the insects, so as to cause them to leap into the tray when roused. Many can thus be caught, the tar holding them fast; or a large hand-net, such as entomologists use in "sweeping" for insects, may be made use of, the plants being swept with it. Rolling the ground in the early morning has been found beneficial, as has been also the treading of a flock of sheep, kept in constant motion in the field, for an hour or two, in the early morning. The latter operations should be carried out only while the dew is still on the herbage; and the same rule should be observed in the application of dressings of all kinds, as these are found to be far more efficacious if put on while the plants are wet. Soot may be sprinkled along the drills of Turnips; but the dressing that has given the best results is said to be made up as follows: One bushel of fresh gas-lime, one of fresh lime, ten pounds of soot, and six pounds of flowers of sulphur, mixed and powdered thoroughly, and applied broadcast or along the rows while the dew is still on. The above amount is enough for two acres. Another mixture also strongly recommended is two bushels of road-scrapings, one of fresh lime, and fourteen pounds of sulphur per acre, applied as above.

TURNIP GALLS. The work of a small Weevil, which also forms somewhat similar Galls on Cabbages. A brief description of the Beetle (*Ceuthorhynchus sulcicollis*) will be found under **Cabbage Gall Weevil** (where, however, the name is spelt *Ceutorrhynchus*). To the particulars there given, a few words may be added. The colour of the insect is black, slightly shining, sprinkled with a few grey hairs, or small scales; the head and thorax are much punctured, and the latter has a deep median furrow, and a small prominence on each side; the wing-cases bear small prominences in front of the tips, and each thigh of the hindmost legs is toothed on the inner side. The length of body is $\frac{1}{12}$in. to $\frac{1}{8}$in. The females lay their eggs near the top of the roots of most Crucifers. In Turnips they do so a little above, or close to, the soil. In a short time, a Gall begins to appear, and at last its form and size may resemble a large half-pea fixed to the root by the flat side; or two or more may unite in growth. The Galls are fleshy, like the roots; and in each is a cavity, tenanted by a curved, whitish, footless maggot, which, when full-fed, bores its way out, drops to earth, and pupates 1in. or 2in. underground. This may be done in autumn, but the more backward larvæ winter in the Galls.

Remedies. The most certain is to cut off and destroy the Galls, with their occupants in them. Applications of soot or gas-lime, or other insecticides, to the soil whence infested plants have been lately removed, have proved valuable in lessening the prevalence of the Beetles. Other measures against injury will be found mentioned under **Cabbage Gall Weevil.**

Turnip Galls—*continued.*

TURNIP, INDIAN. A common name for **Arisæma triphylla** (which *see*)

TURNIP, LION'S. The roots of *Leontice Leontopetalum.*

TURNIP MOTHS. The larvæ of several species of Moths feed on Turnip-plants, some preferring one organ, some another; but the insect which is usually denoted by the name of "Turnip Moth" is one of the *Noctuæ* (*see* **Moths** and **Noctua**). Its scientific name is *Agrotis segetum.* The popular name is rather misleading, as the larvæ feed on many other plants, including most root crops and numerous weeds. Moreover, several other Moths are almost as hurtful, in the larval state, to the roots of Turnips as is *A. segetum.* The genus *Agrotis* is a large one, and in the same species there may exist great variations in markings and shade of colour; while the species show a great general similarity to one another. The fore wings are long and rather narrow, and

FIG. 134. TURNIP MOTH (*Agrotis segetum*).

the hind wings are pale grey. *A. segetum* (see Fig. 134) reaches 1¼in. to 1⅔in. across the fore wings, which are grey

FIG. 135. LARVÆ OF TURNIP MOTH.

Turnip Moths—*continued.*

or brownish, sometimes with a yellowish tinge; they are usually darker towards the front margin, and bear obscure, darker marks and cross-lines; the hind wings are pearly-grey. The larvæ are of the form shown in Fig. 135; they are smoky-brown, tinged with pink or purple, with darker lines and small spots, and a paler line down the middle of the back; the head is small, and much narrower than the body. Owing to their habit of living concealed below the surface of the soil, the larvæ are seldom seen. While young, they feed, in the darkness, above ground; and they are especially disposed to gnaw through the base of the stem in young plants, or to remove the bark, if the stems are too large to be gnawed through. They are indiscriminate feeders, devouring almost all kinds of herbaceous plants. In autumn, they often resort to Turnips, boring into the tuberous roots from below, and eating out large cavities, in which they live during the winter, or till food fails. A few become pupæ, in cocoons in the soil, in October; but by far the larger number pupate in spring; and the moths emerge in June.

The Heart-and-Dart Moth (*Agrotis exclamationis*) is very similar to, and almost as destructive as, the Turnip Moth. The larvæ of the two species are so much alike that it requires a skilled entomologist to distinguish the one from the other; but this is of little moment to gardeners and farmers, as they are as much alike in habits and in destructive powers as they are in appearance.

The larvæ of a good many more species of *Noctuæ* occasionally feed on the roots, leaves, or stems of Turnips, but they are so seldom the cause of perceptible injury to these plants that it is unnecessary to discuss them here.

Remedies. Such larvæ as feed on the leaves of Turnips are best combated by the means detailed under **Turnip Sawfly.** Those larvæ that frequent the roots are not easily reached when they have bored into the Turnips. The time when they can be destroyed, or kept in check, with most hope of success, is in autumn, while they are still living concealed during the day, but come out to feed at night. Hand-picking, by the light of a lantern, is too slow, except to protect choice plants. Soot and gas-lime have been found useful, applied round the top of the root of each plant; and the same is true of gas-water poured on the soil. Ploughing or digging the ground, during winter, is useful by turning up the larvæ and exposing them to rooks and to other insectivorous birds, which are, in truth, the agriculturist's best allies against foes of this sort.

TURNIP RADISH. *See* **Radish.**

TURNIP-ROOTED CELERY. *See* **Celeriac.**

TURNIP, ST. ANTHONY'S. A common name for **Ranunculus bulbosus** (which *see*).

TURNIP SAWFLY (*Athalia spinarum*). One of the most dangerous enemies to Turnips in many years, since the larvæ (known as "Niggers," or "Black Palmers," because of their dark colour) frequently appear in myriads in the fields, and devour the leaves of the young plants. Often a second sowing has been rendered necessary; and even a third or a fourth has been required at times. The perfect insects are Sawflies (*see* **Tenthredinidæ**), about ¼in. or ⅓in. long, and rather heavy in form. Their ground-colour is clay-yellow, covered with dense, whitish, short hairs. The antennæ, head (except white mouth), spots on thorax, and tips of shanks and of joints of the feet, are black. The wings are transparent, with nerves (except at base) dark. The female lays about 250 eggs, often from ten to twenty on a single leaf, along the margins. The eggs hatch in from six to twelve days. The larvæ at

Turnip Sawfly—*continued.*

first are white, with two black dots on the head; but when nearly full-fed they are black above, paler below, with slate-coloured and black spots on the sides. There are usually several folds of skin, but no hairs, on the body. Often many occur on each leaf, and the leaves are gnawed away to the ribs by them. In about three weeks they reach their full size, and then burrow underground, and form oval cocoons. In these the summer broods lie about three weeks, when they emerge as Sawflies. There are usually three broods of Sawflies each year—in May, July and August, and September. They are partial to flowers, but also sit underneath the leaves of Turnips in dull weather, and may be caught by sweeping the plants with a net. They have been observed to proceed from district to district, beginning at one side of a field, and crossing it to the other, in regular succession. When the larvæ are very numerous, the Turnips are almost wholly eaten down, and suffer so much that the crop is rendered nearly worthless.

Besides the well-known *A. spinarum*, another Sawfly does almost as much harm to Turnips in the larval stage. This is *A. ancilla* (also called *A. glabricollis*). The insects are much like *A. spinarum*; but their ground-colour is reddish or clay-yellow, and they are not hairy. The larvæ of the two species are very much alike, and it is probable that those of *A. ancilla* are often wrongly ascribed to *A. spinarum*. The remedies recommended below are beneficial against both species.

Remedies. Disturbing the larvæ when about to pupate, prevents this latter change, and the insect dies. It is also well to disturb them when changing their skins, as this is seriously hurtful to them, and destroys many. With this object, the plants may be brushed over with a rope, or with such branches as those of Firs, &c., and the larvæ thrown to the ground may be crushed; or quicklime or gas-lime may be sprinkled on the soil around the plants. Anything that will promote the rapid growth of the Turnip-plants is valuable, as diminishing the risk of injury; hence, watering or irrigating the plants with liquid manure, or even with pure water alone, is advisable, and has the further advantage of being directly injurious to the larvæ. Thick sowing is recommended, as part of the crop usually escapes, unless the larvæ are excessively numerous; but it brings with it serious drawbacks. Ducks have been employed with advantage to reduce the numbers of larvæ, and have, at times, saved the crops; but they are apt to suffer from eating the larvæ in quantities, becoming affected with diarrhœa, and getting very thin.

TURNIP-SEED WEEVIL (*Ceuthorhynchus assimilis*). A small Weevil, closely related to, and very much like, the gall-makers of the same genus (*C. sulcicollis*), known as **Cabbage Gall** or **Turnip Gall Weevils** (which *see*). It differs from the latter in the grey colour due to the pale hairs or scales scattered all over its dark body, and in the hinder thighs not being toothed on the inner side; and it is also slightly smaller. Its life-history is as follows: The Beetles usually emerge from the pupæ in autumn; they pass the winter in shelter, and may be found, in spring and early summer, on flowers of Cabbages, Turnips, and other cultivated or wild *Cruciferæ*, feeding upon the flowers. The females lay their eggs in the immature fruits; and the larvæ feed on the seeds, and, when full-fed, bore out of the seed-vessels, fall to the ground, and burrow into it, there to become pupæ.

Remedies must be confined to the capture of the Beetles, by nets or otherwise, on the flowers, since the habits of the larvæ, and the situation of the pupæ, almost preclude other means of capturing them freely.

TURNSOLE. *See* **Heliotropium.**

TURPENTINE-TREE. A common name for various species of *Abies, Pinus, Pistacia,* &c.

TURPENTINE VESSELS. "Tubes formed in the interstices of tissue, into which turpentine or such secretions are naturally drained during the growth of a plant. They are common in Conifers" (Lindley).

TURPINIA (named in honour of P. Turpin, French botanical artist and naturalist, who died in 1840). SYNS. *Dalrymplea, Eyrea, Lacepedea, Ochranthe, Triceraia.* ORD. *Sapindaceæ.* A genus embracing about eight species of stove or greenhouse, glabrous trees or shrubs, inhabiting India, the Indian Archipelago, China, the West Indies, and the northern provinces of South America. Flowers white, small, in spreading, axillary and terminal panicles; calyx five-cleft; petals five, orbicular, sessile, imbricated; stamens five. Fruit nearly globose, three-celled. Leaves opposite, exstipulate, imparipinnate or very rarely simple; leaflets opposite, serrulated, sometimes stipellate, coriaceous. Branchlets terete. The species known in gardens are here described. They thrive in a compost of peat, loam, and sand. Propagation may be effected by ripened cuttings, inserted in sand, under a glass, in heat.

T. arguta (sharp). *fl.* dirty-white, or purplish when in bud; inner sepals and petals oblong-ovate, about equal in length, the two outer sepals rather smaller; panicle dense, terminal. March. *l.* slightly crenate, 3in. to 6in. long, glabrous. *h.* 3ft. to 4ft. China, 1826. Greenhouse shrub. SYN. *Ochranthe arguta* (B. R. 1819).

T. insignis (remarkable). *fl.* sweet-scented; calyx segments unequal; petals very shortly unguiculate; panicle terminal. May. *l.* serrulated. *h.* 20ft. Mexico, 1847. A handsome, stove tree. SYN. *Lacepedea insignis.*

T. nepalensis (Nepaul). A synonym of *T. pomifera.*

T. occidentalis (Western). Cassava Wood. *fl.*, primary divisions of the panicle racemiform, opposite, bearing small corymbs, of which the upper ones are usually alternate. May. *fr.* dark blue. *l.*, leaflets two or three pairs, elliptic-oblong, crenate or serrate, glabrous, petiolulate, stipellate. *h.* 20ft. to 30ft. West Indies, 1824. Stove tree.

T. pomifera (apple-bearing). *fl.*, primary branches of the panicle opposite. May. *fr.* red, purplish, yellow, or green, ¼in. to ½in. in diameter. *l.* 5in. to 20in. long; leaflets three to nine, elliptic, oblong, or ovate, acuminate, 2½in. to 8in. long. *h.* 25ft. or less. India and China, 1820. Stove shrub or tree. (B. F. S. 159, under name of *T. nepalensis.*)

TURPINIA (of Persoon). A synonym of **Poiretia** (which *see*).

TURRÆA (named in honour of George Turra, 1607-1688, Professor of Botany at Padua, and author of several botanical works). ORD. *Meliaceæ.* A genus comprising about sixteen species of stove or greenhouse trees or shrubs, inhabiting tropical and South Africa, tropical Asia, and Australia. Flowers white, elongated; calyx four or five-toothed or parted; petals four or five, elongated, free, twisted; staminal tube cylindrical, four or five-toothed; anthers four or five, included or exserted; disk absent; peduncles axillary, few-flowered, many-bracted. Leaves alternate, petiolate, entire or obtusely lobed. The best-known species are here described. A compost of loam and peat is most suitable for their culture. Propagation may be effected by cuttings of ripened wood, with the leaves intact, inserted in sand, under a glass, in heat.

T. heterophylla (variable-leaved). *fl.* clustered at the ends of the branches; petals ten to fourteen lines long, shorter than the style; peduncles silky-tomentose, three to eight lines long. May. *l.* short-stalked, ovate, acute or obtusely pointed, 2in. to 3½in. long, undivided or sub-trilobed, the young ones pubescent beneath. Upper Guinea, 1843. Stove shrub. (B. R. xxx. 4, under name of *T. lobata.*)

T. obtusifolia (obtuse-leaved).* *fl.* on solitary, axillary peduncles six to ten lines long; petals glabrous, ligulate, 1in. to 1½in. long. May. *l.* obovate, 1in. to 1¾in. long, narrowed into short petioles, entire or obtusely three-lobed, with revolute margins, glabrous on both sides, paler beneath. Branches glabrous. *h.* 4ft. to 6ft. South Africa, 1872. Greenhouse shrub. (B. M. 6267.)

T. rigida (rigid). *fl.* in sessile fascicles from nodes of branches or old wood; corolla ⅝in. to 1in. long, tubular, at first silky on the outside. April. *l.* alternate, short-stalked, entire, firm, obtuse or acute, 4in. to 6in. long, penninerved. Mauritius, 1816. A glabrous, stove bush or tree.

TURRITIS. Included under *Arabis.*

TURTLE HEAD, or **TURTLE BLOOM.** *See* **Chelone.**

TUSSACA. A synonym of **Goodyera** (which *see*).

TUSSACIA (named after F. R. de Tussac, a French botanist, who wrote a Flora of the Antilles in 1808). SYN. *Chrysothemis.* ORD. *Gesneraceæ.* A small genus (four or five species) of stove herbs, with creeping, simple or branched rhizomes, natives of the West Indies, Guiana, and Columbia. Calyx often scarlet, free, ample, campanulate, five-angled or five-winged; corolla yellow, lined with purple, the tube rather broadly cylindrical, the limb oblique, erecto-patent, broadly five-lobed; stamens included; peduncles umbellately many-flowered, in the upper axils, disposed in a terminal corymb. Leaves opposite, often ample; upper floral ones reduced to bracts. The only species introduced are here described. Both are perennials. For culture, *see* **Gesnera.**

T. nitida (shining). A synonym of *Catopsis nitida.*

T. pulchella (pretty).* *fl.*, calyx red, the lobes deltoid, serrated; corolla nearly regular, 1in. to 1½in. long, the tube erect, cylindrical, half as long again as the calyx. July. *l.* ovate or ovate-oblong, acute, 3in. to 7in. long, crenate-serrate above the narrow-cuneate base, scarcely petiolate. *h.* 1ft. West Indies, 1830. SYN. *Besleria pulchella* (B. M. 1146; L. B. C. 1028).

T. semi-clausa (half-closed). *fl.*, calyx cinnabar-red, campanulate, truncate; corolla golden-yellow, radiately striped with crimson-purple; umbels forming short, terminal panicles. *l.* broadly ovate, pubescent, dentate-ciliate, bright green. Stems branching, fleshy, spotted with red. Brazil, 1870. A showy plant. (I. H. ser. iii. 28.) In some varieties, the stems and petioles are violet-coloured.

TUSSILAGO (the old Latin name used by Pliny, and derived from *tussis,* a cough; alluding to the medicinal use of the leaves). Coltsfoot. ORD. *Compositæ.* A monotypic genus. The species, *T. Farfara,* is a British, scapigerous herb, with rather large, yellow flowers and cobwebby leaves. As the flower-head dies away, the scape lengthens, and finally bears a head of white, serrated pappus hairs. The leaves are used for cigar making, and are smoked in cases of asthma. The species and its variety thrive in any soil, and, if required, may be propagated by cutting up the long, creeping rhizomes. Other plants formerly included here will be found under **Homogyne, Petasites,** &c.

FIG. 136. TUSSILAGO FARFARA VARIEGATA.

Tussilago—*continued.*

T. Farfara variegata (variegated Coltsfoot).* *l.* large, broadly cordate, angled or lobed, toothed, margined or blotched with creamy-white. A pretty plant, but not one which should be indiscriminately introduced into gardens, as its creeping roots give much trouble at times. See Fig. 136.

TUSSOCK MOTHS. Species of *Bombycina*, nearly related to the Vapourer Moths (*see* **Orgyia antiqua**). By some entomologists they are included in the genus *Orgyia*; but most separate them from that genus because the females of the Tussocks have full-sized wings, while those of the Vapourer Moths are almost wingless. The Tussocks are placed in a genus named *Dasychira* (from *dasus*, hairy, and *cheir*, the hand, or fore limb; in allusion to the hairs on the first pair of legs). There are two British species, generally known as the Pale Tussock (*D. pudibunda*), or Hop-dog, and the Dark Tussock (*D. fascelina*). The males have the antennæ much fringed; while in the females they are nearly simple. In both sexes the body is heavy, and the wings are rather broad. The front pair of legs are hairy, especially in the male. The larvæ resemble those of the Vapourer Moths in having erect, brush-like tufts of hair on the middle line of the back, from the fifth to the eighth segments, and a backward-pointing tuft on the back of the twelfth segment. When full-fed, the larvæ spin slight cocoons among their food-plants, and become hairy pupæ.

The Pale Tussock (*D. pudibunda*) is about 2in. or 2¼in. in spread of the fore wings. Its general colour is grey, with three narrow, dark bands across the fore wings; or, in the male, a broad, smoke-coloured cross-bar, with darker, waved lines. The hind wings are pale grey, with a faintly darker bar. The larva is pale green, with a deep black, velvety band on the back between each two segments from the fifth to the eighth; the tufts of erect hairs on the back are yellow. The larvæ live on many trees, such as Beech, Chestnut, Lime, and Oak, and they also feed on Hops, whence the name "Hop-dog," often applied to them.

The Dark Tussock (*D. fascelina*) seldom exceeds 1¾in. across the front wings, which are smoky-grey, with three wavy, blackish cross-bars; two of these lie close together beyond the middle of the wing. The hind wings are smoky-grey, as are also the head and body. The larvæ are dark grey, with lemon-yellow hairs, but the tufts on the back are nearly black instead of yellow. The larvæ feed occasionally on Plum and other fruit-trees, on Hazel, Heather, Oak, and various herbs. They are, however, seldom the cause of serious injury, hardly ever being abundant.

Remedies. Hand-picking, or shaking the larvæ from the branches on to sheets of paper or cloth, will prove sufficient to prevent harm, should it be threatened at any time.

TUTSAN. *See* **Hypericum Androsæmum.**

TWEEDIA. A synonym of **Oxypetalum** (which *see*).

TWIN FLOWER. *See* **Bravoa geminiflora.**

TWISTED STALK. *See* **Streptopus.**

TYCHIUS QUINQUE-MACULATUS. Larvæ of a Weevil known by this name feed in the seeds of Peas and other *Leguminosæ*. During summer, when full-fed, they fall to the soil, and become pupæ in it. The Beetles emerge from the ground in autumn, live in concealment during winter, and, in summer, the females lay eggs in the flowers, or, rather, in the ovaries of the

Tychius quinque-maculatus—*continued.*

flowers, of the food-plants. The Beetles are about ⅛in. long, and are elongate-ovate in form. The beak is long, and curves downwards. The colour is black, with ruddy or yellow scales above, a white line down the middle of the thorax, and a white spot, and white inner border, on each wing-case; the body is pure white below. The thighs are toothed, and black; the rest of the legs, and the antennæ, are dull-red. The Beetles are not very common in England, which is fortunate, as it is difficult to apply a remedy—at least, while the larvæ are in the pods. A dressing of soot along the rows of Peas, towards the end of summer and autumn, would probably be of service against the pupæ in the soil.

TYDÆA (named after Tydeus, a son of Œneus, King of Calydon). ORD. *Gesneraceæ*. A small group of stove herbs, natives of tropical America, now included under *Isoloma*. The species hybridise freely, and many crosses have received distinctive names in continental gardens. For culture of the plant described below, *see* **Gesnera.**

FIG. 137. UPPER PORTION OF PLANT OF TYDÆA AMABILIS.

T. amabilis (lovely). *fl.* dark rose-coloured; corolla large, very villous, the limb of five unequal, rounded lobes, dotted with purple, the oblique tube paler-coloured within, but marked with larger dots and blotches; peduncles axillary, solitary, as long as, or the upper ones much longer than, the leaves, erect, purple below. Spring. *l.* opposite, ovate, bluntly serrate-toothed, somewhat acuminate, dull green above, pale beneath. Stem 1ft. to 2ft. or more high, greenish-purple. New Grenada, 1855. Whole plant hairy. See Fig. 137. (B. M. 4999.)

TYLE BERRY. A common name for **Jatropha multifida** (which *see*).

TYLOCHILUS. A synonym of **Cyrtopodium** (which *see*).

TYLOGLOSSA. A synonym of **Justicia** (which *see*).

TYLOPHORA (from *tylos*, a swelling, and *phoreo*, to bear; probably in reference to the coronal lobes). Including *Hybanthera*. ORD. *Asclepiadeæ*. A genus comprising about forty species of stove, twining or rarely sub-erect sub-shrubs or herbs, inhabiting tropical and sub-tropical Africa, Asia, and Australia, New Caledonia, and Norfolk Island. Flowers rather small, sometimes minute; calyx deeply five-cleft or five-parted; corolla tube short, sub-rotate, deeply five-cleft, the lobes rather broad; coronal lobes five, fleshy; cymes umbelliform or shortly racemose. Leaves opposite. The species are not very ornamental. Only three call for description here; they are all twining sub-shrubs. For culture, *see* **Hoya.**

T. asthmatica (anti-asthmatic). East Indian Ipecacuanha. *fl.* green, rather large, on long pedicels; corolla segments acute, peduncles shorter than the leaves, bearing two or three sessile, few-flowered umbels towards the apex. November. *l.* ovate or nearly round, acuminate, often cordate at base, glabrous above; petioles glandless, sub-terete. *h.* 5ft. India, 1814. (B. M. Pl. 177; B. M. 1929, under name of *Cynanchum viridiflorum.*)

T. barbata (bearded). *fl.* dingy-purple, not numerous, in one or rarely two umbels; corolla ⅜in. broad, slightly bearded inside. July. *l.* on slender petioles, ovate or ovate-lanceolate, acute, not cordate, 1in. to 2in. long. *h.* 10ft. Australia, 1822.

T. grandiflora (large-flowered). *fl.* purple, one to three on a short, interpetiolar peduncle; corolla 1in. across, the lobes obtuse. July. *l.* on slender petioles, ovate to ovate-lanceolate, shortly and acutely acuminate, more or less cordate, 1in. to 2in. long, pubescent. *h.* 10ft. Australia, 1822.

TYMPANANTHE. A synonym of **Dictyanthus** (which *see*).

TYPHA (the old Greek name used by Theophrastus). Bullrush; Cat's Tail; Club-rush; Reed Mace. ORD. *Typhaceæ*. A genus comprising about ten species of slender or robust, stove or hardy, marsh-loving herbs, found in tropical and temperate regions. Male and female spadices similar, superposed, nearly terminating the peduncle, caducous or remote, naked or with a very caducous, stipitate spathe; peduncle erect, terete, straight, slender or robust, undivided. Radical leaves elongated-linear, rather thick and spongy; cauline ones few, shorter. The two British species, which thrive in rivers, ditches, and ponds, are here described. They may be increased by seeds, sown in a pot plunged nearly to the level of the soil in water; or by division of the rhizomes.

T. angustifolia (narrow-leaved). Small Bullrush. *fl.* brown; spikes ¼in. to ⅜in. in diameter, separated by ½in. to 1in., the female often interrupted. July. *l.* ¼in. to ⅜in. broad, dark green, not glaucous, convex beneath, channelled towards the base. Plant smaller in all its parts than *T. latifolia*. (Sy. En. B. 1386.)

T. latifolia (broad-leaved). Cat-o'-nine-tails; Marsh Beetle; Reed Mace, &c. *fl.* dark brown; spikes 6in. to nearly 12in. long, 1in. in diameter, contiguous or nearly so, silky from the copious filiform perianth scales. July and August. *l.* distichous, 3ft. to 6ft. long, ⅜in. to 1½in. broad, linear, obtuse, nearly flat, sub-glaucous. Stem 3ft. to 7ft. high, terete. (Sy. En. B. 1385.)

TYPHACEÆ. A small natural order of aquatic or marsh-loving herbs, with perennial rhizomes, inhabiting Europe, temperate and tropical Asia, Australia, and temperate North America. Flowers small, inserted on a monœcious spadix, or by abortion dicœcious, in heads or dense spikes; perianth none; stamens of the males numerous, accompanied by bristles or membranous scales; anthers two-celled; ovaries of the females accompanied by bristles or scales, sessile, or on long stalks when ripe. Fruits membranous or sub-drupaceous, one or rarely two-celled, sessile or stipitate. Leaves alternate, linear, entire, erect and emerging or floating, sheathing at base; cauline ones subtending the spadices, or forming an involucre before flowering. Stems cylindric, not

Typhaceæ—*continued.*

knotty, solid, simple or branched. The pollen of *Typha* is made into bread by the natives of Scind and New Zealand. Only a couple of genera—*Sparganium* and *Typha*—and sixteen species are included in this order.

TYPHONIUM (from *Typhon*, a mythological giant; the name was given by the ancients to some Aroid). Including *Heterostalis*. ORD. *Aroideæ* (*Araceæ*). A genus embracing about thirteen species of stove, tuberous, perennial herbs, inhabiting tropical Asia, Australasia, and the Pacific Islands. Flowers monœcious, the males and females remote; spathe tube convolute, accrescent, persistent, the throat constricted, the lamina ovate or lanceolate, acute or acuminate, erect or recurved, deciduous; spadix sessile or stipitate, included, the appendage variable, often stipitate; peduncle usually short. Leaves cotemporary with the flowers, sagittate or hastate, three to five-lobed or parted, or pedatisect, the petiole elongated. The species known to cultivation are described below. They thrive in light, rich soil, and during the growing season require an abundant supply of water. After the leaves have died down, water must be withheld until growth recommences. The pots containing the tubers can be stored away in any dry, warm place. Propagation is effected by division of the tubers.

T. Brownii (Brown's).* *fl.*, spathe with the convolute base ovoid, the lamina 4in. to 5in. long, very broad, of a deep purple inside; male and female spikes about ½in. long, 1in. distant; peduncle shorter than the petiole. April. *l.* divided into three narrow or broad-lanceolate lobes or segments, the lateral ones horizontally divaricate, 4in. to 6in. long, the middle one usually rather longer and narrower; petioles 6in. to 12in. long. Australia, 1875. (B. M. 6180.)

T. cuspidatum (cusped). *fl.*, spathe tube green, ovoid or oblong; lamina lanceolate, prolonged into a whip-like process, or shorter and acuminate; spadix whitish, shorter or longer than the lamina, sometimes very long, the appendix very shortly stipitate, conico-subulate; peduncle slender, scarcely one-third the length of the petioles. *l.* sagittate or hastate, oblong and scarcely cordate at base, or three-lobed or parted; petioles three or four times longer than the blades. *h.* 1ft. Bengal, Java, &c., 1819. SYN. *Arum flagelliforme* (L. B. C. 396).

T. divaricatum (divaricate). *fl.*, spathe tube oblong-ovoid, the lamina dark purple, ovate, long-acuminate; peduncle usually short. July. *l.* cordate or hastate-sagittate, somewhat three-lobed; middle lobe somewhat ovate or oblong-ovate, acute or acuminate, twice as long as the ovate or lanceolate lateral lobes; petioles slender, twice as long as the blades. *h.* 2ft. East Indies, 1759. SYNS. *T. trilobatum* (of Curtis), *Arum divaricatum*, *A. trilobatum* (B. M. 339; L. B. C. 516), *A. t. auriculatum* (B. M. 2324).

T. diversifolium Huegelianum (Huegel's variable-leaved). *fl.*, spathe erect, 4in. to 7in. long; lamina rich velvety purplish-brown inside, reticulated with pale green at base and apex; spadix shorter than the spathe; appendix 2in. to 2½in. long, blackish; ovaries purple; stigmas white. *l.* one or two, very variable in form, sagittate, hastate, or five-lobed, with the basal lobes directed upwards. Himalayas, 1879. SYN. *Heterostalis Huegeliana.*

T. trilobatum (three-lobed). *fl.*, spathe tube oblong; lamina greenish outside, rose-purple within, oblong-ovate, acuminate, four times as long as the tube; spadix with a terete, conical, shortly stipitate appendix; peduncle slender, one-third the length of the petioles. *l.* hastate, sub-tripartite; lobes all broadly ovate, acuminate; petioles nearly thrice as long as the blades. *h.* 1½ft. East Indies, 1714. SYNS. *Arum orixense* (A. B. R. 356; B. R. 450; L. B. C. 422).

T. trilobatum (three-lobed), of Curtis. A synonym of *T. divaricatum.*

TYTONIA (named after Arthur Tyton, by whom many of the oldest inhabitants of our gardens were preserved). ORD. *Geraniaceæ*. A monotypic genus, the proper name of which, according to the authors of the "Genera Plantarum," is *Hydrocera*. The species is a beautiful, stove aquatic. It should be grown in rich, loamy soil, in large pots or pans of water, and placed in a warm part of the stove. The plant may be increased by seeds, sown in spring.

T. natans (swimming). Water Balsam. *fl.* beautifully variegated with red, white, and yellow, large, irregular; sepals five, coloured; petals five, the outer front ones largest, concave; stamens five; peduncles axillary, short, one to three-flowered. July to September. *l.* alternate, narrow. Tropical Asia, 1810. SYN. *Hydrocera triflora.*

UCRIANA. A synonym of **Tocoyena** (which *see*).

UDORA. A synonym of **Elodea** (which *see*).

UGENA. Included under *Irygodium*.

UGNI. Included under **Myrtus** (which *see*).

ULEX (an old Latin name used by Pliny for some similar shrub). Furze; Gorse; Whin. Including *Stauracanthus*. ORD. *Leguminosæ*. A genus embracing not more than a dozen species of mostly hardy shrubs, with very spiny branchlets, found in Western Europe and North-western Africa. Flowers yellow, solitary or shortly racemose in the axils of the spines or scales towards the tips of the branchlets; calyx membranous, coloured, two-parted; petals shortly clawed; standard ovate; bracts small. Leaves spinescent or reduced to small scales. *U. europæus* and *U. nanus* are well-known, ornamental, British plants. All thrive in ordinary soil, and may be increased by cuttings, or by seeds.

U. europæus (European). Common Furze; Gorse; Thorn Broom, &c. *fl.* ¾in. long, odorous; calyx hairs black, spreading; bracts ovate. February and March; August and September. *l.* small; leaflets hairy. Spines sometimes furnished with minute, one-foliolate leaves. Branches spreading. *h.* 2ft. to 3ft. Western Europe, &c. (Sy. En. B. 323.) *flore-pleno* is a beautiful, double-flowered variety. The form *strictus* (Irish Furze) has erect branches.

U. Gallii (French). A variety of *U. nanus*.

U. genistoides (Genista-like). Portuguese Furze. *fl.* axillary or terminal, solitary; standard and keel tomentose outside; wings narrow, much spreading. August. *l.* small, scale-like, spiny, glabrous. Branches rigid, decussate. *h.* 1ft. to 3ft. Mediterranean region, 1823. Half-hardy. (B. R. 1452.) SYN. *Stauracanthus aphyllus*.

U. nanus (dwarf). Cat Whin; Tam Furze. *fl.* ½in. long, more racemose than in *U. europæus*; calyx adpressedly pubescent. July to November. *fr.* persistent till the following season. Spines ¼in. to 1½in. long. Stems 1ft. to 3ft. high; branches drooping. England, Belgium, France.

U. n. Gallii (French). Primary spines rigid, longer than those of *U. nanus*. Branches ascending. (F. d. S. 441 *b* and Sy. En. B. 324, under name of *U. Gallii*.)

ULIGINOSE. Inhabiting swampy places.

ULLOA. A synonym of **Juanulloa** (which *see*).

ULLUCUS (from *Ulluco*, the Quitan name). SYN. *Melloca*. ORD. *Chenopodiaceæ*. A monotypic genus. The species is a half-hardy, fleshy, decumbent and twining herb, its creeping rhizome and angular stem emitting tuber-bearing roots. It is extensively grown in the mountains of Peru and Bolivia for the sake of its small tubers. As a substitute for the Potato, the plant has been unsuccessfully tried in this country. It thrives in any light soil, and may be increased by its tubers.

U. tuberosus (tuberous-rooted). *fl.* golden, in ample, axillary, loose-flowered racemes; perianth rotate, five-parted, with a very short tube; bracts at the bases of the pedicels lanceolate, persistent; bracteoles below the flowers very conspicuous. June. *l.* alternate, on thick petioles, rounded-cordate, acute, entire. *h.* 1ft. Andes of South America, 1846. (B. M. 4617; G. C. n. s., xxiii., p. 216; L. J. F. 221.)

ULMEÆ. A tribe of *Urticaceæ*.

ULMUS (the old Latin name used by Virgil, &c.). Elm. ORD. *Urticaceæ*. A genus comprising about sixteen species of hardy, unarmed trees, broadly dispersed over north temperate regions, extending in Asia to tropical mountains. Flowers polygamous, mostly hermaphrodite, fascicled; perianth loosely campanulate, four to nine (often five) cleft, the lobes imbricated; stamens four to eight (often five); filaments erect, at length exserted. Fruit a one-seeded samara. Leaves alternate, distichous, serrated, penniveined, deciduous or sub-perennial; stipules lateral, scarious, very caducous. Elm wood is rather hard, and reddish; it is used specially for wheelwrights' work, shafts, axletrees, screws for presses, &c. Exotoses or wens are often developed on Elm trunks, which acquire great hardness, and are much sought for by cabinet-makers, from the different patterns exhibited by the twisted arrangement of their wood fibres. Elm-trees arrive at perfection

Ulmus—*continued.*

in 150 years, but they will live for more than four times that period. They were held in high estimation by the ancients, not only on account of their leaves, which were dried and used as fodder, but also on account of their being used as props for Vines. The common Elm (*U. campestris*) grows very rapidly in light, rich land; but its wood is proportionately light and porous, and of little value compared with that grown on strong land, which is of a closer and stronger texture, and at the heart will have the colour, and almost the hardness and weight, of iron. Propagation is effected by layers, suckers, grafting, and budding. Layers are usually made in autumn, or in the course of the winter, and become rooted, or fit for removal, in the course of a year. Suckers are produced in abundance by some of the species and varieties, and afford a ready means of increase. Whip or splice-grafting is best performed, close to the root, in spring; the plants thus treated make shoots of 3ft. or 4ft. in the same year, and never throw up suckers, unless the graft is buried in the soil. The Scotch Elm (*U. montana*) luxuriates in a deep, rich loam; but it becomes most valuable in a sandy loam lying on rubble-stone or on dry rock. It is most readily propagated by seeds; these may be sown as soon as ripe (about the middle of June), in which case many plants will be obtained in the same season; or they may be dried in the shade, and stored in bags or boxes, in a dry place, until the following March or April. *U. americana* delights in a low, humid situation. Its wood is inferior to that of the common Elm. The species best-known to cultivation are here described; all have brownish flowers, appearing from March to May.

FIG. 138. LEAF AND FRUIT-BEARING TWIGS OF ULMUS CAMPESTRIS.

U. alata (winged). Wahoo or Winged Elm. *fl.* on slender, drooping, jointed pedicels or peduncles; perianth segments obovate. *fr.* ovate or oval, downy on the face, at least when young, fringed-ciliated. *l.* ovate-oblong and oblong-lanceolate, acute, rather thick, 1in. to 2½in. long, smooth or nearly so above, downy beneath. Branches (at least some of them) corky-winged; branchlets and bud-scales nearly glabrous. *h.* 30ft. to 40ft. North America, 1820.

Ulmus—*continued.*

U. americana (American).* American or White Elm. *fl.* in close fascicles, on slender, drooping peduncles or pedicels, which are jointed above the middle; perianth seven to nine-lobed; fascicles close. *fr.* oval or ovate, glabrous, except on the margins, ½in. long. *l.* obovate-oblong or oval, abruptly acute, sharply and often doubly serrated, 2in. to 4in. long, smooth or nearly so above, softly pubescent or soon glabrous beneath. Branches not corky; branchlets and buds glabrous. *h.* 80ft. to 100ft. North America, 1752. An ornamental tree. (T. S. M. p. 322.)

FIG. 139. YOUNG SHOOT OF ULMUS CAMPESTRIS ROTUNDIFOLIA.

U. campestris (field-loving).* Alme; Aume-tree; common Elm. *fl.*, perianth smaller than in *U. montana;* stamens often four. *fr.* usually obovate. *l.* 2in. to 3in. long, less cuspidate than in *U. montana*, often narrow at base, scabrid above and pubescent beneath, or nearly glabrous. Trunk attaining 20ft. in girth, with rugged bark; root sending up abundant suckers. *h.* 125ft. Europe (Britain). See Fig. 138. (B. M. Pl. 232.) SYN. *U. carpinifolia. U. glabra* and *U. suberosa* are regarded, by Hooker, as mere varieties of this species; but for gardening purposes they are kept distinct in this work.

U. c. acutifolia (acute-leaved). *l.*, in old specimens, more tapering, and branches more pendulous, than in *U. c. alba*, which this variety otherwise resembles.

U. c. antarctica (Antarctic). A graceful, small-leaved form, somewhat resembling *U. c. viminalis.* The name of this form is very inappropriate, as there are no Elms in the Southern hemisphere.

U. c. aurea (golden). This is one of the most distinct and desirable of all the ornamental Elms; it has foliage like that of *U. c. antarctica*, but of a uniform golden-bronze colour. (B. H. 1866, 19; I. H. 513.) SYN. *U. Roseelsii.*

U. c. Berardi (Berard's). A distinct and pretty form, of somewhat erect habit, with small, rather rigid leaves. This originated as a seedling in the nurseries of Simon-Louis Bros., near Metz.

U. c. betulæfolia (Birch-leaved). *l.* somewhat resembling those of the common Birch.

U. c. chinensis (Chinese). A low and rather tender bush. China.

U. c. concavæfolia (concave-leaved). This is scarcely distinct from *U. c. cucullata.*

U. c. cornubiensis. Cornish Elm. *l.* small, strongly veined, coriaceous. Branches bright brown, smooth and somewhat flexuous when young, and very compact, becoming upright with age. "This variety, in the climate of London, is a week or a fortnight later in coming into leaf than the common Elm, from which, and from all other varieties, it is readily distinguished by the bark of old trees, which never scales off, but tears asunder, exhibiting its fibrous construction, in the manner of the bark of the Sweet Chestnut. There are many fine trees of this variety in Kensington Gardens." (Loudon.)

U. c. cucullata (hooded). *l.* curiously curved, something like a hood.

Ulmus—*continued.*

U. c. foliis-variegatis (variegated-leaved). *l.* striped with white, very ornamental in spring.

U. c. latifolia (broad-leaved). *l.* broader than in the species, and expanding very early in spring.

U. c. nana (dwarf). This very distinct variety is said not to grow above 2ft. high in ten or twelve years.

U. c. parvifolia (small-leaved). A very common variety in all the woods of the South of Russia, and varying in height from that of a medium-sized tree to that of a diminutive shrub, according to soil and climate.

U. c. planifolia (flat-leaved). A handsome, small tree, closely resembling *U. c. parvifolia.*

U. c. rotundifolia (round-leaved). This form is characterised by its roundish-oval or sub-orbicular leaves. See Fig. 139.

U. c. sarniensis. Jersey Elm. A free-growing variety, differing very little from the type.

U. c. stricta (upright). Red English Elm. One of the most valuable timber-trees of the small-leaved kinds; growth very rigid. The timber is of excellent quality, and the tree forms poles of equal diameter throughout.

U. c. tortuosa. Twisted Elm. This is the only Elm that grows freely from cuttings. The wood of the tortuous parts of the trunk is valuable for the naves of wheels.

U. c. umbraculifera (umbrella-bearing). A compact-growing form, with a dense, umbrella-like head.

U. c. viminalis (twiggy). *l.* small. Branches numerous, slender, twig-like. A very distinct and elegant variety.

U. c. virens (green). Kidbrook Elm. "Almost evergreen in a mild winter; and, as such, is the most ornamental tree of the genus. It must not, however, be depended upon as a timber-tree, because, in some autumns, the frost kills the shoots. The bark is red, and the tree of spreading habit. This, like *U. c. stricta*, grows well upon chalk." (Loudon.)

U. carpinifolia (Hornbeam-leaved). A synonym of *U. campestris.*

U. effusa (effuse). A synonym of *U. pedunculata.*

U. fulva (fulvous). Slippery or Red Elm. *fl.* nearly sessile; perianth segments and stamens seven to nine. *fr.* orbicular, eight to nine lines wide, not ciliated, the cell pubescent. *l.* ovate-oblong, acuminate, doubly serrated, 4in. to 8in. long,

FIG. 140. LEAFY AND FLOWER-BEARING TWIGS OF ULMUS GLABRA.

Ulmus—*continued.*

very rough above, softly downy beneath, and slightly rough downwards, sweet-scented in drying. Branchlets downy; buds before expansion, softly downy with rusty hairs. North America. A small or medium-sized tree, with tough, reddish wood, and a very mucilaginous inner bark. (B. M. Pl. 233; T. S. M. p. 334.)

U. glabra (smooth). Wych Elm. *fl.* nearly sessile, five-cleft. *fr.*, samaras obovate, naked, deeply cloven, smaller than those of most other kinds. *l.* elliptic-oblong, doubly serrated, smooth, very unequal at base, not elongated at the extremity. *h.* 60ft. to 80ft. Europe (Britain). See Fig. 140. (Sy. En. B. 1286, under name of *U. suberosa glabra*.) Hooker regards this as merely a form of *U. campestris*.

U. g. glandulosa (glandular). *l.* very glandular beneath.

U. g. latifolia (broad-leaved). *l.* oblong, acute, very broad.

U. g. major (greater). Canterbury Seedling. Of more vigorous growth than the type.

U. g. microphylla (small-leaved). *l.* small.

U. g. pendula (pendulous). Downton Elm. A "weeping" variety.

U. g. variegata (variegated). *l.* variegated.

U. g. vegeta (vigorous).* Chichester or Huntingdon Elm. The most vigorous kind of Elm propagated in British nurseries, often making shoots from 6ft. to 10ft. in length in one season. The tree attains a height of 30ft. in ten years from the graft.

U. major (greater). A form of *U. montana*.

U. montana (mountain-loving).* Scotch or Wych Elm. *fl.* shortly pedicellate, five to seven-parted. *fr.*, samaras oblong or nearly round, glabrous, slightly cloven. *l.* 3in. to 6in. long, often 3in. in diameter, doubly and trebly serrated, cuspidate, unequally rounded or cordate at base, rough above, pubescent or nearly glabrous beneath. Branches long, spreading. *h.* 80ft. to 120ft. Europe (Britain), Siberia. (Sy. En. B. 1287.) Most of the following varieties are distinct and handsome trees, and are well worth cultivating, either for use or for ornament:

U. m. cebennensis (Cevennes). A variety of spreading habit, but of much less vigorous growth than the normal form.

U. m. crispa (curled). *l.* crisped, thickly plicate-rugose, irregularly incised-pinnatifid. Habit slender and stunted. SYN. *U. urticæfolia*.

U. m. fastigiata (pyramidal). Exeter or Ford's Elm. *l.* peculiarly twisted, very harsh, feather-nerved, enfolding one side of the shoots, retaining their deep green until they fall off. A very remarkable, pyramidal form.

U. m. major (greater). *l.* falling almost a month sooner than those of *U. m. minor*. This tree is of upright and rapid growth, with few branches; in some stages, it approaches the habit of the type, but is of a more tapering form.

U. m. minor (lesser). Compared with *U. m. major*, this is of a more branching and spreading habit, of lower growth, with more twiggy shoots, which are more densely clothed with leaves.

U. m. nigra (black). Black Irish Elm. A spreading tree, with the habit of the normal form, but with more spreading leaves.

U. m. pendula (pendulous). "A beautiful and highly characteristic tree, generally growing to one side, spreading its branches in a fan-like manner, and stretching them out sometimes horizontally, and at other times almost perpendicularly downwards, so that the head of the tree exhibits great variety of shape." (Loudon.)

U. m. rugosa (wrinkled). Bark reddish-brown, cracking into short, regular pieces, very like that of *Acer campestre*.

U. parvifolia (small-leaved). *fl.* shortly pedicellate; perianth four or five-cleft. *fr.* small, ciliated. *l.* small, narrow-lanceolate, oblique at base, slightly acute or scarcely acuminate at apex, simply serrated; adults coriaceous, highly glabrous, or the middle nerve and under side sparsely puberulous. Branches twiggy, often arcuate-deflexed. China and Japan. A medium-sized or diminutive shrub, according to the soil in which it grows.

U. pedunculata (pedunculate). *fl.*, perianth oblique; stamens six to nine, often eight, shortly exserted; pedicels slender, elongated, jointed; inflorescence pendulous. *fr.* glabrous, except the densely-ciliated margin. *l.* ovate or obovate, acuminate, deeply and doubly serrated, slenderly membranous, softly pubescent beneath. *h.* 50ft. to 60ft. Europe, 1800. SYN. *U. effusa*.

U. Roseelsii (Roseels'). A synonym of *U. campestris aurea*.

U. suberosa (slightly erose). Cork-barked Elm. *fl.* stalked, four or five-cleft. *fr.*, samaras almost orbicular, deeply cloven, glabrous. *l.* pointed, rough, doubly and sharply serrated. Branches spreading, their bark corky. *h.* 60ft. to 100ft. Europe (Britain). According to Hooker, this is merely a form of *U. campestris*. (Sy. En. B. 1285.)

U. s. erecta (erect). This tree has a tall, narrow head, resembling that of the Cornish Elm (*U. campestris cornubiensis*); but it differs from that variety in having much broader leaves and a corky bark.

U. s. foliis-variegatis (variegated-leaved). This is only distinguished from the type by its variegated leaves.

U. urticæfolia (Nettle-leaved). A synonym of *U. montana crispa*.

ULNA. The average length of a man's arm—about 2ft.

ULOSTOMA. A synonym of **Gentiana** (which *see*).

ULUXIA. A synonym of **Columellia** (which *see*).

UMBEL. An inflorescence in which the flowers expand centripetally, and their stalks radiate from a common centre. A simple Umbel is shown in Fig. 141.

FIG. 141. SIMPLE UMBEL OF ASTRANTIA HELLEBORIFOLIA.

UMBELLATE. Disposed in or resembling umbels.

UMBELLET, UMBELLULA. A secondary or partial umbel; an umbel formed at the end of one of the rays of a general umbel.

UMBELLIFERÆ. A large natural order of herbaceous or rarely woody plants, principally inhabiting the Northern hemisphere. Flowers hermaphrodite or often polygamo-monœcious, rarely dicœcious, umbellate or rarely capitate or whorled; calyx five-lobed, or almost wanting; petals five, valvate or sub-imbricate in bud, inserted outside an epigynous disk, free, caducous, the points generally inflexed, sometimes two-cleft or two-parted, the outer often largest; stamens five, alternate with, and inserted like, the petals; filaments inflexed in bud; anthers two-celled, introrse; umbels simple, or often duplicate-compound, terminal, solitary or many in a panicle. Fruit dry, two-celled, dividing into two mericarps, the surface marked with ten more or less prominent ridges. Leaves usually alternate, entire or variously toothed, cut, lobed, or pinnate; petioles usually dilated at base. Stem usually furrowed or channelled, knotty, fistular or full of pith. Among the useful Umbellifers, the following (indigenous to Britain) may be noted: Carrot (*Daucus Carota*), Chervil (*Anthriscus Cerefolium*), Parsley (*Carum Petroselinum*), and Parsnip (*Peucedanum sativum*). The order embraces upwards of 150 genera and about 1300 species, few of which are remarkable for horticultural beauty. Illustrative genera are: *Apium*, *Daucus*, *Myrrhis*, *Narthex*, *Peucedanum*, *Sium*, *Smyrnium*.

UMBELLIFEROUS. Umbel-bearing.

UMBELLULARIA (a diminutive from *umbella*, a sunshade, an umbel; in allusion to the form of inflorescence). SYNS. *Drimophyllum*, *Oreodaphne*. ORD. *Laurineæ*. A monotypic genus. The species is a half-hardy, tall, evergreen tree or (on mountains) shrub, emitting a strong odour of camphor. For culture, *see* **Laurus.**

U. californica (Californian). Californian Sassafras. *fl.* greenish-yellow, shortly pedicellate, in solitary, cano-pubescent or glabrous umbels; perianth tube very short, the limb of six segments; involucres pedunculate, solitary in the upper axils, or clustered at the tips of the branches, very caducous. June. *l.* alternate, highly odorous, lanceolate-oblong, slightly narrowed at both ends, 2in. to 4½in. long, penniveined and singularly reticulated. Branchlets twiggy, slender, mostly glabrous. *h.* sometimes as much as 100ft. California, 1862. SYNS. *Ocotea californica*, *Oreodaphne californica* (B. M. 5320).

UMBER MOTHS. Under this name are included two species of Geometer Moths, belonging to the genus **Hybernia** (which *see*), viz., *H. defoliaria*, or the Mottled

Umber Moths—*continued.*

Umber (see Fig. 142), and *H. aurantiaria*, or the Scarce Umber. The latter species, despite its popular name, is by no means rare, while the former is abundant; though neither species is often seen, owing to the perfect insects appearing towards the end of autumn, and being nocturnal in their habits. The females have only stumps of wings, and, being totally unable to fly, they have to crawl up the tree trunks to lay their eggs on the buds. The males have large, conspicuous wings, and fly in search of the females. The two species of Umber Moths are nearly alike in size and form, but differ in colours and markings.

FIG. 142. MOTTLED UMBER MOTH (HYBERNIA DEFOLIARIA), showing Male, Female, and Larva.

The Mottled Umber has the body brown, with two rows of dark spots on the back of the abdomen. The fore wings of the male are usually pale brown, with two dark brown, rather irregular cross-bands, and a dark central spot, and the hind wings are paler, with a brown central spot. In some males, the wings are reddish-brown, closely sprinkled with darker dots, and other variations are not rare. The larva feeds on almost all kinds of trees. It is cylindrical, and rather slender, with six true legs in front, and four prolegs or claspers behind. The back is brown, bordered on each side by a narrow, waved, black band, and crossed by grey markings. The sides are bright yellow; but the spiracles are white, and are surrounded by brown spots.

The Scarce Umber Moth has the body orange-brown, with darker spots, as in the other species. The fore wings of the male are dull orange, with three darker narrow cross-bars, two near the base, and the other beyond the middle. Beyond the latter, near the margin, is a row of brownish spots. The hind wings are paler, and all the wings have a dark central dot. The larva feeds on Whitethorn, and occasionally on Oak and Birch. It is at first deep yellow, but when full fed it is dark dusky-green, with a pale brown stripe down the middle of the back.

The pupæ of both species are protected in slight cocoons on the surface of the ground.

Remedies. The females are unable to fly on to the trees; and they may be prevented from crawling up if a ring of tar and cart-grease, mixed in equal parts, is painted on the trunk near the ground, or on a belt of cloth or paper, or on a straw rope, fastened around the tree. The larvæ

Umber Moths—*continued.*

may be shaken off by jarring the branches, and should be collected on sheets of cloth or paper and destroyed. All surface rubbish that could shelter the pupæ should be cleared off.

UMBILICATE. Navel-like; depressed in the centre.

UMBILICUS. Included under **Cotyledon** (which *see*).

UMBONATE. Round, with a projecting point in the centre, like the boss or *umbo* of an ancient shield; *e.g.*, the pileus of many Agarics.

UMBRACULIFORM. Umbrella-shaped.

UMBRELLA LEAF. *See* **Diphylleia cymosa.**

UMBRELLA PINE, or **PARASOL FIR.** *See* **Sciadopitys verticillata.**

UMBRELLA PLANT. *See* **Saxifraga peltata.**

UMBRELLA TREE. *See* **Magnolia Umbrella** and **Thespesia populnea.**

UMBRELLAWORT. *See* **Oxybaphus.**

UNANUEA. A synonym of **Stemodia** (which *see*).

UNARMED. Destitute of prickles, spines, or other hard projections; pointless.

UNCARIA (from *uncus*, a hook; the old petioles are converted into hooked spines). SYNS. *Agylophora*, *Ourouparia*. ORD. *Rubiaceæ*. A genus comprising about thirty species of stove, climbing shrubs, all tropical Asiatic, except one African and one American. Flowers yellowish, in globose, axillary, pedunculate, solitary or paniculate heads; calyx tube spindle-shaped, the limb five-lobed or parted; corolla tube long, funnel-shaped, the limb of five valvate lobes; stamens five, on the glabrous throat of the corolla; peduncles often headless, converted into hooked tendrils. Leaves opposite, shortly petiolate; stipules entire or bifid. *U. Gambier*, the only species calling for description here, thrives in a compost of loam, sand, and peat. Propagation may be effected by cuttings, inserted in sand, under a glass, in heat.

U. Gambier (Gambier). Gambier Catechu. *fl.* pedicellate; calyx tomentose; corolla ½in. long; peduncles all axillary, bracteate in the middle, rarely more than 1in. long. May. *l.* ovate or ovate-lanceolate, obtusely sub-caudate or acuminate, 4in. to 5in. long, coriaceous, glabrous. *h.* 10ft. India, 1825. The gambier of commerce is obtained from this species. (B. M. Pl. 139.)

UNCARIA (of Burchell). A synonym of **Harpagophytum** (which *see*).

UNCATE, UNCIFORM, UNCINATE. Bent or curved at the tip like a hook.

UNCIFERA (from *uncus*, a hook, and *fero*, to bear; alluding to the curved process to which the pollen masses are attached). ORD. *Orchideæ*. A small genus (three species) of stove, epiphytal Orchids, natives of Khasya. Flowers rather small or mediocre, very shortly pedicellate, in lateral, dense, spike-like racemes; sepals sub-equal, free; petals similar or rather smaller; lip affixed to the base of the column, the base produced in a rather long, curved spur; lateral lobes small, the middle one entire or slightly three-lobed; pollen masses two. Leaves distichous; sheaths persistent, clothing the stem. *U. heteroglossa*, the only species introduced, is mainly of botanical interest. It thrives on a block or in a basket.

Uncifera—*continued.*

U. heteroglossa (variable-lipped). *fl.* white (?); sepals and petals oblong, blunt; lip hollowed out, the front border thickened; spur ascending, hooked; raceme rather short, pale, closely speckled with red. 1878.

UNCINATE. *See* **Uncate.**

UNDER-SHRUB. A small, woody plant, the ends of its branches perishing annually.

UNEDO. A synonym of **Arbutus** (which *see*).

UNEQUALLY PINNATE. Pinnate, with an odd, terminal leaflet.

UNGNADIA (named after Baron von Ungnad, the introducer of the Horse Chestnut). ORD. *Sapindaceæ*. A monotypic genus. The species is a half-hardy shrub or small tree, allied to *Pavia*. It is best grown in the open air in summer, and removed to a cool conservatory for winter. It will thrive in almost any soil, and may be propagated by layering, or by imported seeds.

U. speciosa (showy). *fl.* pink, polygamous, in lateral, aggregated corymbs or fascicles; calyx sub-equal, four or five-partite; petals four or five, sub-equal, the claws connate-crested at apex; stamens seven to ten. June. *l.* alternate, exstipulate, impari-pinnate; leaflets six or seven pairs, 4in. long, very shortly petiolulate, ovate-lanceolate, obtuse and acuminate, the terminal one long-petiolulate. Texas, 1850. (F. d. S. 1059.)

UNGUACHA. A synonym of **Strychnos** (which *see*).

UNGUICULATE. A term applied to petals which have an *unguis* or stalk.

UNI. This term, used in Latin compounds, signifies one: *e.g.*, Uniflorous, one-flowered; Unijugate, of one pair; Unilateral, one-sided; Unisexual, of one sex, having stamens only or pistils only.

UNICORN BEETLE (*Copris lunaris*). This can scarcely be included among Garden Insects, strictly so called; yet a brief notice of it will not be out of place, as it may at times be found in gardens in the South-east of England, especially around London, and is sure to attract notice on account of the curious horn on the head. The

FIG. 143. MALE UNICORN BEETLE (COPRIS LUNARIS), about twice the natural size.

general form is shown in Fig. 143, which is, however, about twice the natural size. The colour is glossy black, with a fringe of chestnut hairs round the edge of the body. The head and thorax of the males bear outgrowths or horns, as shown in the figure. The wing-cases are grooved lengthwise. The horns of the females are much less conspicuous. These Beetles are beneficial, rather than otherwise, in gardens, inasmuch as the females make burrows in the soil, and carry dung into them for the nourishment of the larvæ, which are hatched from eggs deposited among it.

UNICORN PLANT. A common name for *Martynia lutea* and *M. proboscidea*.

UNINTERRUPTED. Consisting of regularly increasing or diminishing parts, or of parts of the same size.

UNIOLA (from *unus*, one; so-called by Linnæus owing to the union of the glumes). Spike Grass. SYNS. *Chasmanthium*, *Trisiola*. ORD. *Gramineæ*. A small genus (four species) of hardy and half-hardy, perennial Grasses, natives of North America. Spikelets closely many-flowered, very flat and two-angled; glumes lanceolate, compressed-keeled; stamens three; panicles sometimes elongated, sometimes ample, loose or dense. Leaves flat or convolute. Perhaps the most ornamental species are described below. Seeds should be sown, in early spring, in the open border.

U. latifolia (broad-leaved). *fl.* acute, ciliated on the keel, all but the lowest perfect and monandrous; spikelets at length oblong, 1½in. to 2in. long, hanging on long pedicels; panicle loose. August. *l.* nearly 1in. broad, flat. Culm 2ft. to 4ft. high. (B. H. vii., p. 192.)

U. paniculata (prominent-panicled). *fl.* glabrous, bluntish, several of the lower ones sterile, the fertile ones with three stamens; spikelets ovate, 1½in. to 2in. long, on short pedicels; panicle open, elongated. *l.* narrow, convolute when dry. Culm elongated. *h.* 4ft. to 8ft.

UNISEMA. A synonym of **Pontederia** (which *see*).

UNONA (probably a variation from *Anona*, an allied genus). ORD. *Anonaceæ*. A genus embracing eighteen species of stove trees or climbing shrubs; four or five are found in Africa and the rest in tropical Asia. Flowers mostly solitary, axillary or extra-axillary, rather large; sepals three, valvate; petals six, valvate or open in æstivation, biseriate; stamens numerous, tetragonal-cuneate. Leaves alternate, entire, exstipulate. Several species have been introduced, but are probably lost to cultivation.

UPAS-TREE. *See* **Antiaris toxicaria.**

UPLAND WILLOW OAK. *See* **Quercus cinerea.**

UPRIGHT PORTUGAL LAUREL. A common name for **Cerasus lusitanica myrtifolia** (which *see*).

URALEPIS. A synonym of **Triodia** (which *see*).

URALEPSIS. *See* **Triodia.**

URANANTHUS. A synonym of **Eustoma** (which *see*).

URANIA. A synonym of **Ravenala** (which *see*).

URARIA (from *oura*, a tail; alluding to the bracts). SYN. *Doodia* (of Roxburgh). ORD. *Leguminosæ*. A genus embracing eight species of stove, suffruticose perennials, inhabiting tropical Asia, Africa, and Australia. Flowers very numerous, minute, racemose; calyx tube very short, the two upper teeth short, the three lower ones usually elongated; standard broad; wings adhering to the obtuse keel; stamens diadelphous. Leaves stipellate; leaflets one to nine. Several species have been introduced; but it is doubtful whether any are in cultivation. Those described below thrive in a compost of sand, loam, and peat. Propagation may be effected by cuttings, inserted in sand, under a glass, in heat.

U. crinita (hairy). *fl.* purplish, ¼in. long; racemes dense, above 1ft. long. July. *l.*, upper ones three to seven-foliolate; leaflets oblong, sub-coriaceous, green and smooth above, paler and reticulate-veined beneath, 4in. to 6in. long, 1½in. to 2in. broad, rounded at base. *h.* 3ft. to 6ft. India.

U. picta (painted). *fl.* purple; corolla slightly exserted; racemes dense, cylindrical, 6in. to 12in. long. July. *l.*, leaflets four to six, rarely nine, linear, rigidly sub-coriaceous, glabrous above, minutely pubescent beneath. Stems robust, finely downy. *h.* 3ft. to 6ft. Himalayas, Philippines, &c., 1788.

URCEOLARIA (of Cothenius). A synonym of **Schradera** (which *see*).

URCEOLARIA (of Herbert). A synonym of **Urceolina** (which *see*).

URCEOLATE. Hollow and contracted at or below the mouth, like a pitcher.

URCEOLINA (from *urceolus*, a small cup or pitcher; alluding to the shape of the perianth). SYNS. *Collania*, *Urceolaria* (of Herbert). Including *Leperiza* (in part), *Pentlandia*, and *Sphærotele* (of Link). ORD. *Amaryllideæ*. A small genus (three species) of greenhouse, bulbous plants, inhabiting the Andes of South America. Flowers many in an umbel, rather long-pedicellate; perianth erect, at length recurved or pendulous, contracted above the ovary, and then enlarged into an oblong-tubular or urceolate throat or limb, the lobes sub-equal, connivent or connate, shortly spreading at apex; stamens equally affixed to the throat, often exceeding the perianth; filaments straight; involucral bracts two, scarious; scape solid. Leaves flat, ovate, oblong, or narrow, contracted into the petioles. For culture, *see* **Amaryllis.**

U. aurea (golden). A garden synonym of *U. pendula*.

U. latifolia (broad-leaved). *fl.*, perianth segments yellowish-red, greenish at apex, ovate, minutely acuminate, connivent, equal; scape erect, 1ft. or more high, solitary, terete. April. *l.* petiolate, oblong, acute, 1ft. long, 2in. to 3in. broad, striated above, shining, nerved beneath, glabrous. SYN. *Leperiza latifolia* (B. M. 4952).

U. miniata (scarlet). *fl.* nodding; perianth cinnabar-red or scarlet, 1¼in. long, glabrous, the segments broadly ovate, acute; scape erect, slightly twisted above, 8in. to 14in. long. September. *l.* one or two, lanceolate, acute, narrowed and sub-petiolate, 6in. to 8in. long, striated above, the margins reflexed. Bulb as large as a walnut. 1836. SYN. *Pentlandia latifolia* (B. R. 1839, 68).

FIG. 144. URCEOLINA PENDULA.

U. pendula (pendulous). Drooping Urn Flower. *fl.* pendent; perianth yellow in the basal half, green above, margined with white, 2in. long; segments lanceolate, concave, the three outer ones longer. June. *l.* solitary or twin, long-petiolate, erect, many-nerved, glabrous; petioles terete, compressed above. See Fig. 144 (for which we are indebted to Messrs. Veitch and Sons). (B. M. 5464.) SYNS. *U. aurea* (of gardens), *Collania urceolata*.

URECHITES (from *oura*, a tail, and *Echites*, an allied genus; in allusion to the twisted appendages of the corolla). ORD. *Apocynaceæ*. A small genus (four species ?) of prostrate or twining, glabrous or puberulous, stove undershrubs, natives of the West Indies and Mexico. Flowers usually ample; calyx five-parted, glandular inside at base; corolla funnel-shaped, with a short, cylindrical tube, a long tubular-campanulate throat, and five broad, twisted lobes; stamens affixed at the top of the tube; racemes simple, often few-flowered, or reduced to two flowers. Leaves opposite, penniveined. Only one species calls for mention here. For culture, *see* **Dipladenia.**

U. sub-erecta (nearly erect). *fl.* full-yellow, large, on short pedicels; peduncle terminal, hairy, bearing a loose, four to six-flowered cyme. May. *l.* shortly petiolate, ovate or oval, nearly

Urechites—*continued.*

elliptical, but rather acute at each end; young ones (and branches) loosely silky. Stem shrubby in the older portions. New Grenada, 1845. SYNS. *Dipladenia flava* (B. M. 4702), *Echites sub-erecta* (B. M. 1064).

URENA (from *Uren*, the Malabar name). Indian Mallow. ORD. *Malvaceæ*. A small genus (four or five species) of stove herbs or under-shrubs, inhabiting the tropical regions of both hemispheres. Flowers small, sessile or shortly pedunculate, usually clustered; bracteoles five, adnate to the five-cleft or five-toothed calyx; petals five; staminal tube truncate or minutely toothed. Leaves often angular or lobed. The species are mostly uninteresting. *U. lobata*, the only one calling for mention, thrives in any light, rich soil. Propagation may be effected by seeds.

U. lobata (lobed-leaved). *fl.* pink; bracteoles oblong-lanceolate, equalling the calyx. Summer. *l.* cordate, five to seven-lobed, the lobes acute or obtuse; petioles usually shorter than the blades. India. A very variable, more or less hairy, annual herb. (B. M. 3043.)

URGINEA (from the name of an Arab tribe, Ben Urgin, in Algeria). Including *Squilla*. ORD. *Liliaceæ*. A genus comprising about two dozen species of stove, greenhouse, or hardy, bulbous plants, natives of Europe, the Mediterranean region, the East Indies, and tropical and South Africa. Flowers usually numerous, in a terminal raceme, rather small or mediocre, on articulated pedicels; perianth whitish or rarely pale yellowish or pink, at length deciduous; segments six, distinct, nearly equal, campanulate-connivent or spreading; stamens six; scape simple, leafless; bracts small, scarious. Leaves radical, sometimes very narrow-linear, sometimes broadly loriform or nearly oblong. The bulbs of *U. maritima* are well-known in medicine as Squills. The species best known in gardens are here described. With the exception of *U. maritima*, all are natives of South Africa, and require greenhouse heat. For culture, *see* **Scilla.**

U. altissima (very tall). *fl.*, perianth nearly campanulate, three to four lines long, the segments whitish, with a purplish-green keel, ligulate; pedicels slightly spreading or ascending, the lower ones six to nine lines long; raceme cylindrical, dense, 1ft. to 2ft. long, 1½in. to 2in. broad; scape 2ft. to 3ft. long, ½in. or more thick. May. *l.* five or six, lorate-lanceolate, glabrous, 1ft. to 1½ft. long, 1½in. to 2in. broad at base, acute at apex. Bulb globose, 4in. to 6in. thick. 1789. SYN. *Drimia altissima* (B. M. 1074).

U. exuviata (stripped). *fl.*, perianth five to six lines long, the segments whitish, purple-keeled; pedicels ascending, the lower ones four to six lines long; raceme rather dense, ten to twenty-flowered, 2in. to 4in. long. June. *l.* two to four, hard, semi-terete, glabrous, flexuous, 1in. to 1½in. long, half to three-quarters of a line broad. Bulb globose, 1in. to 1¾in. thick, the outer scales long-produced, transversely striped. 1795. "Jacquin applied the specific name of *exuviata* from some resemblance in the membranous tunics of the bulb to the sloughs annually cast by snakes." SYN. *Albuca exuviata* (B. M. 871).

U. filifolia (thread-leaved). *fl.*, perianth three to four lines long, the segments whitish, purple-keeled, oblong; pedicels three to six lines long; raceme rather dense, six to twenty-flowered; scape erect, slender, 6in. to 15in. long. June. *l.* three to six, filiform, hard, glabrous, flexuous, 8in. to 12in. long, a quarter to half a line thick. Bulb globose, 1in. thick, fuscous-tunicated. 1820. SYN. *Albuca filifolia* (B. R. 557).

U. fragrans (fragrant). *fl.* odorous; perianth five to six lines long, the segments whitish, purple-keeled, oblong; pedicels four to six lines long; raceme rather loose, twelve to twenty-flowered, 4in. to 6in. long; scape slender, terete, glaucous, 1ft. long. July. *l.* twelve to twenty, semi-terete, glabrous, persistent, 6in. to 8in. long, half a line broad. Bulb globose, 1½in. to 2in. thick. 1791. SYN. *Albuca fugax* (B. R. 311).

U. maritima (sea-loving).* Sea Onion; Squills. *fl.*, perianth three to four lines long, the segments whitish, with a greenish-purple keel; pedicels six to nine lines long; raceme dense, 1ft. or more long; scape 1ft. to 3ft. long, terete, reddish. Autumn. *l.* appearing in spring, ten to twenty, lanceolate, fleshy-herbaceous, glaucous-green, glabrous, 1ft. to 1½ft. long, 2in. to 4in. broad above the middle. Bulb ovoid, 4in. to 6in. thick. Mediterranean region, 1829. Half-hardy. SYNS. *U. Scilla* (B. M. Pl. 281), *Ornithogalum Squilla* (B. M. 918).

U. physodes (bladder-like). *fl.*, perianth ¼in. long, the segments whitish, purple-keeled; pedicels eight to ten lines long; raceme rather dense, thirty to sixty-flowered, 3in. to 5in. long, cylindrical;

Urginea—*continued.*

scape slender, 6in. long. June. *l.* five or six, lanceolate, fleshy-herbaceous, glabrous, 6in. to 9in. long, 1in. to 1½in. broad. Bulb purplish, 1½in. to 1¾in. thick. 1804. SYN. *Albuca physodes* (B. M. 1046).

U. Scilla (Scilla). A synonym of *U. maritima.*

URINE. An excellent manure, because of the substances contained in it. Of these, one of the most important is Ammonia, either uncombined, or united with various acids to form compounds. From these substances plants are able to obtain the Nitrogen required for the production of protoplasm. There are also various mineral compounds in solution in Urine, in a form available for plants; in fact, the Urine of most animals is of more value as a manure than their solid excrement. Analysis of various Urines gives the following results: Urine of cattle contains 8 per cent. of solid matters; of horses, 11 per cent.; of sheep, 13 per cent.; of pigs, 25 per cent.; and of man, from 3 to 6 per cent. Amongst the substances in Urine are Carbonates, Phosphates, Chlorides, and Sulphates of Ammonia, and of other alkalies, along with a good deal of Urea and of Uric Acid. The two last substances readily undergo chemical changes into Ammonia and its compounds. The addition to the Urine of Gypsum, or of coarse Sulphuric Acid, forms Sulphate of Ammonia, and thus prevents the loss of the Ammonia by evaporation into the atmosphere. Urine should be permitted to become stale or to putrefy before being applied to the soil. It is a very valuable manure for almost all kinds of garden produce and fruit-trees; and, when diluted with three or four times its bulk of water, may be employed in the fluid state. It may also be mixed up as a compost with soil and vegetable refuse. The mass should be allowed to ferment for some time, and may then be applied like ordinary farm-yard manure. Owing to its very strong and unpleasant smell when stale, Urine should not be freely used close to houses. Instead of being allowed to run to waste, as it so often is, arrangements should be made for collecting the farm-yard Urine into a tank, and for storing it up for use as described above.

URN FLOWER, DROOPING. *See* **Urceolina pendula.**

UROCYSTIS (from *oura*, a tail or stalk, and *kystis*, a vessel or bladder; in allusion to the stalked, vesicular spores). This is one of the genera included in the group of Fungi known to botanists as the *Ustilaginei*, and in popular language as Smuts, from their loose, dark spores giving a dirty appearance to the plants in which they grow. The Fungi in this genus are parasites; they grow for a while inclosed in the tissues of living plants; then, when the spores ripen, they form dark swellings, whose growth bursts the outer tissues of the host-plant, and discloses the powdery mass of spores. The parts in which these are formed are usually much swollen and distorted. The spores of *Urocystis* vary a good deal in size and form, but usually consist of a layer of rather small cells, surrounding a larger central cell, which is the one actively concerned in the development of new mycelium when the spore is kept in a warm, moist atmosphere. The spores are fixed on the tips of branches till ripe, when they fall from the stalks. The species of *Urocystis* are hurtful to cultivated plants, and the following occur in Britain: *U. Violæ* grows in petioles and other organs of the Sweet Violet (*Viola odorata*); *U. Anemones* is very common on various kinds of *Anemone*, and on allied plants; and *U. sorosporioides* occurs on leaves and flowers of *Thalictrum.*

For remedies, *see* **Ustilago.**

UROPEDIUM. Included under **Selenipedium** (which *see*).

UROPETALUM. A synonym of **Dipcadi** (which *see*).

UROSKINNERA (named after G. Ure Skinner, a merchant and collector of Central American plants). ORD. *Scrophularineæ.* A genus consisting of a couple of species of softly villous, stove herbs, natives of Central America and Mexico. Flowers rosy-violet, rather large, declinate, shortly pedicellate, with two bristly bracts at base; calyx tubular-campanulate, with four or five short, bristly teeth; corolla tube elongated, enlarged above, the limb of five scarcely unequal, spreading lobes; stamens four, included; style elongated, very shortly bifid; spike or raceme terminal, dense, secund. Leaves opposite, petiolate, soft, crenate. *S. spectabilis*, the only species introduced, thrives in sandy loam. It may be increased by cuttings, inserted in sand, under a bell glass, in heat.

U. spectabilis (showy). *fl.* in sessile, terminal, very close spikes about 3in. long; calyx small, hairy, four-toothed; corolla smooth, 1½in. long, funnel-shaped. July. *l.* oblong, toothed, 2in. to 4in. long. *h.* 1ft. to 1½ft. Mexico, 1856. Plant grey with close hairs. (B. M. 5009; F. d. S. 1433.)

UROSPATHA (from *oura*, a tail, and *spatha*, a spathe; referring to the long-pointed spathe in most of the species). ORD. *Aroideæ* (*Araceæ*). A genus comprising about ten species of stove, marsh-loving herbs, with thick rhizomes, natives of tropical America. Flowers hermaphrodite, the lower ones sterile; spathe erect, closed at base, at length opening, long-narrowed above, straight, decurved, or twisted, persistent; spadix sessile or nearly so, inappendiculate, much shorter than the spathe; perianth segments and stamens four to six; peduncle elongated. Leaves few, hastate-sagittate, with diverging nerves or nearly parallel ribs; petioles elongated, sheathing at base. The two introduced species thrive in light, loamy soil, and require an abundance of water when growing. They may be propagated by division of the rootstock.

U. desciscens (degenerate). *fl.*, spathe brown and claret-coloured, convolute below, gaping above, long-acuminate, incurved or arcuate; spadix sessile, cylindroid, obtuse, shorter than the spathe tube; peduncle equalling the petioles. *l.* broadly lobed, the anterior one triangular, acuminate, the posterior rather longer, oblong, acuminate, very inequilateral; petioles smooth, nearly twice the length of the blades. *h.* 3ft. Brazil, 1860.

U. sagittifolia (sagittate-leaved). *fl.*, spathe yellowish-green or deep green, mottled or blotched with grey or rosy-red, lanceolate, long-acuminate; spadix green, cylindrical, a quarter to one-fifth the length of the spathe. *l.* broadly lobed, hastate-sagittate, the anterior lobe lanceolate-triangular, acuminate; basal lobes rather longer, oblong-lanceolate; petioles slightly scabrous or scabrid, warted. Para, 1866. "*U. elegans*, *U. grandis*, *U. picturata*, *U. spectabilis*, and *U. splendens*, all from Para, are garden names for what are probably varieties of this species" (N. E. Brown).

UROSPERMUM (from *ouros*, a tail, and *spermum*, a seed; alluding to the beaked achenes). Sheep's Beard. SYN. *Arnopogon.* ORD. *Compositæ.* A small genus (two species) of hardy, annual or biennial, slightly-branched herbs, natives of the Mediterranean region. Flower-heads yellow, long-pedunculate at the tips of the branches; involucre campanulate, with seven or eight bracts in one series, spiny outside; receptacle conical, naked; ray florets ligulate, truncately five-toothed at apex; achenes beaked. Leaves radical or alternate, deeply toothed or lyrate-pinnatifid; cauline ones amplexicaul. Only one species calls for mention here. It is a biennial, of easy culture in common soil.

U. Dalechampii (Dalechamp's). *fl.-heads* on naked peduncles; involucre velvety-pubescent. June. *l.* variously runcinate, toothed. *h.* 1½ft. South Europe, 1739. SYN. *Arnopogon Dalechampii* (B. M. 1623; S. F. G. 780).

URSINIA (named after John Ursinus, of Regensburg, 1608-1666, who wrote an "Arboretum Biblicum"). Including *Sphenogyne.* ORD. *Compositæ.* A genus comprising fifty-four species of greenhouse or half-hardy, annual or perennial herbs or shrubs, natives of South Africa, one also extending to Abyssinia. Flower-heads solitary or loosely paniculate, heterogamous; involucre

Ursinia—*continued.*

hemispherical or broadly campanulate, with several series of imbricated bracts; receptacle paleaceous; ray florets wholly yellow or purplish outside; disk yellow; achenes glabrous or pubescent. Leaves alternate, serrated, pinnatifid, or often pinnately dissected. A selection of the best-known species is here given. They are very elegant plants, and succeed in a compost of loam and peat. *U. anthemoides* and *U. pulchra* may be increased by seeds. The rest are greenhouse shrubs, cuttings of which will root readily in sand, under a glass.

U. abrotanifolia (Southernwood-leaved). *fl.-heads* solitary on tomentose peduncles 6in. to 10in. long; ray florets wholly yellow. July. *l.* bi-tripinnatisect, 1½in. to 2in. long; segments narrow-linear, divergent, acute, the lowest short and nearly simple. Branches erect, curved, leafy, clothed with pale, woolly hairs. *h.* 1ft. to 2ft. 1789. SYN. *Sphenogyne abrotanifolia.*

U. anthemoides (Chamomile-like). *fl.-heads* on long, naked, drooping peduncles; ray florets purplish outside. August. *l.* either pinnatipartite or sub-pinnatipartite; lobes linear-filiform, acute or mucronate, the lower shorter or very small, the upper trifid or spinulose, spreading. *h.* 3in. to 12in. 1774 Half-hardy annual. SYNS. *Arctotis anthemoides* (B. M. 544), *Sphenogyne anthemoides.*

U. crithmifolia (Samphire-leaved).* *fl.-heads* 1in. to 1½in. in diameter, on peduncles 3in. to 10in. long; ray florets wholly bright yellow. July. *l.* pinnatipartite or trifid, 1½in. to 2in. long; lobes linear-filiform, semi-terete, acute, the lower ones short or obsolete, the rest elongated. *h.* 1ft. to 2ft. 1768. Erect and densely leafy. SYN. *Sphenogyne crithmifolia* (B. M. 3042).

U. dentata (toothed). *fl.-heads* rather small; ray florets coppery beneath; peduncles 6in. to 9in. long, one-headed. June. *l.* pinnatipartite, ½in. to ⅔in. long; lobes short, entire or trifid, the teeth tipped with a bristle. Branches curved, closely leafy. *h.* 1ft. to 2ft. 1787. SYN. *Sphenogyne dentata.*

U. pilifera (bristle-bearing). *fl.-heads* on long, sub-hispid pedicels; ray florets purplish outside. December. *l.* pinnatisect, fleshy, spreading, shortly hispid; lobes linear, tipped with a bristle. 1821. Shrub diffuse. SYN. *Sphenogyne pilifera* (B. R. 604).

U. pulchra (pretty).* *fl.-heads* bright orange; ray florets somewhat lanceolate, bitten at the extremities. June and July. *l.* twice pinnate, sessile; leaflets linear, acute, somewhat recurved. Stems roundish, slightly declinate at the base, ascending, branched, smooth. *h.* 1ft. Native place unknown. 1836. Hardy annual. SYN. *Sphenogyne speciosa* (P. M. B. vi., p. 77).

URTICA (the old Latin name used by Horace and Pliny, from *uro*, to burn; referring to the stinging properties of most species). Nettle. ORD. *Urticaceæ.* A genus comprising about thirty species of greenhouse or hardy, annual or perennial herbs, rarely shrubby at base, armed with stinging hairs; they are broadly dispersed over temperate and sub-temperate regions. Flowers monœcious or dicœcious; clusters cymulose, spicate, racemose, or paniculate; inflorescence unisexual or androgynous. Leaves opposite, petiolate, toothed or incised-lobed. The British Flora includes *U. dioica* (the young leaves of which are a good pot-herb), *U. pilulifera* (the most virulent native Nettle), and *U. urens.* The stinging effects of *U. urentissima* (Devil's Leaf), a native of Timor, are said to be so violent as to last for twelve months, and sometimes to cause death. Many species produce excellent fibre, and several are considered to possess medicinal properties. None are of any horticultural value.

U. involucrata (involucred). A synonym of *Pilea pubescens.*

U. reticulata (reticulated). A synonym of *Pilea reticulata.*

URTICACEÆ. A natural order of trees, shrubs, or herbs, broadly dispersed over the temperate and warmer regions of the globe. Flowers unisexual or rarely polygamous, regular or by reduction irregular; perianth simple, calycine; stamens of the male flowers as many as the perianth segments, very rarely fewer or rather more, the anthers ovate or oblong; staminodes of the females rare, the ovary superior, or in a few genera more or less inferior; primary inflorescence centripetal, axillary or at the nodes, never terminal; ultimate inflorescence normally centrifugal, cymulose; bracts often small or wanting; bracteoles minute or wanting, sometimes conspicuous. Fruit indehiscent, one-seeded. Leaves alternate or rarely opposite, entire, toothed, lobed, or palmately parted, not pinnate, very rarely pinnatifid. Among the more important members of this order the following may be enumerated: Breadfruit-tree (*Artocarpus incisa*), Elm (*Ulmus*), Fig (*Ficus Carica*), Hemp (*Cannabis sativa*), Hop (*Humulus Lupulus*), Indiarubber-plant (*Ficus elastica*), Mulberry (*Morus alba* and *M. nigra*). Several of the species are valuable timber trees. The order is divided into eight tribes: *Artocarpeæ, Cannabineæ, Celtideæ, Conocephaleæ, Moreæ, Thelygoneæ, Ulmeæ,* and *Urticeæ.* It embraces nearly 110 genera and 1500 species. Examples: *Artocarpus, Cannabis, Ficus, Humulus, Morus, Ulmus, Urtica.*

URVILLEA (named after Capt. Dumont D'Urville, of the French navy, an acute botanist, who was sent out to ascertain the fate of La Peyrouse). ORD. *Sapindaceæ.* A genus comprising about half a score species of climbing or twining, stove shrubs, inhabiting tropical America. Flowers whitish, in axillary racemes; peduncles bearing two tendrils at the apex. Leaves alternate, stipulate; leaflets entire or deeply toothed, sometimes pellucid-dotted. One or two species have been introduced, but they are unworthy of cultivation. *U. ferruginea* is now and then met with in botanic gardens, and is interesting on account of the peculiar structure of its triquetrous stems.

USTERIA (of Cavanilles). Included under **Maurandya** (which *see*).

USTILAGINEI (named from *Ustilago*, the largest genus in the group). This is the scientific name of the Fungi included under the popular name of **Smut**, under which name is given a short account of them, and of the characters by which the more important genera are distinguished from one another. The mycelium seems to enter, usually, into seedling plants, and to make its way among the cells of all parts; but while the reproductive organs (spores) of some species may be formed in masses in almost any part of the host-plant, those of certain others are produced only in the reproductive organs (stamens or ovaries), or in the leaves. Several examples are mentioned under **Smut.** *See also* **Ustilago.**

USTILAGO (from *ustus*, burnt; in allusion to the scorched appearance of the organs of the host-plants in which the spores are developed). A genus of Fungi, belonging to the group *Ustilaginei* (*see* **Smut**). It is distinguished from the other genera in the group by the spores, each being a single, isolated, roundish or angular cell, which germinates by a mycelium filament pushed out at one side. The spores are usually brown, dark purple, or nearly black, when in mass. *Ustilago* may be regarded as nearly typical of the *Ustilaginei.* About forty European species are known; many of these occur in the British Islands. A number of them live in the leaves or flowers of Grasses: *e.g., U. longissima* forms black streaks in leaves of *Glyceria fluitans* and other swamp-loving Grasses; *U. hypodytes* grows below the leaf-sheaths of several Grasses, including among others the ornamental species, *Stipa pennata* and *S. capillaris*; *U. segetum* (see Fig. 145) destroys the ovaries of Oats, Barley, and many other Grasses; *U. Caricis* (*U. urceolorum*) is very common on many of the species of *Carex*, infesting the ovaries, and reducing them to the state of balls of sooty-looking powder; *U. utriculosa* and some allied forms destroy the ovaries of various kinds of *Polygonum*; *U. violacea* (*U. antherarum*) is exceedingly common in the flowers of *Lychnis, Silene, Stellaria graminea,* and other caryophyllaceous plants, filling the stamens with its reddish-violet spores, and thus destroying the flowers; *U. flosculorum* acts similarly in the flowers of *Scabiosa arvensis, S. Columbaria,* and *S. succisa*; *U. Tragopogi-pratensis* (*U. receptaculorum*) destroys all the florets in the heads of *Tragopogon pratensis* and *T. porri-*

Ustilago—*continued.*

folius, replacing them by a mass of sooty spores. In addition to the above, which are all British species, may be mentioned: *U. Ornithogali*, which, in Germany, forms swellings, about ½in. long, in the leaves of species of *Ornithogalum* and *Gagea*; and *U. Tulipæ*, which forms similar swellings on Tulips. When the spores are ripe, the epiderm above the swellings bursts, and exposes the brown spores to view.

FIG. 145. USTILAGO SEGETUM ON BARLEY, showing (A) Diseased Inflorescence, natural size, and (B) Diseased Spikelet, enlarged.

Treatment. Plants attacked by these Fungi cannot be freed from them, as the mycelium is in the tissues; but frequently only some of the stems on a plant show their presence, and the other parts seem healthy. Such parts as do show the Fungi should be removed and burned, before the spores ripen, in order to prevent their dispersion. To check the ravages of *U. segetum*, the Smut of corn, the seed, before sowing, is sometimes sprinkled with stale urine, and then raked in quicklime till it becomes white; or it is steeped in a solution of one pound of sulphate of copper in five quarts of water, this quantity of solution being sufficient for four bushels of wheat. The object aimed at is to kill any spores of the Fungi adhering to the seeds, without destroying the vitality of the latter; and the above methods are found

Ustilago—*continued.*

to give good results. Perhaps they might prove successful with garden seeds also, and might be employed with advantage against *Urocystis* and the other genera of *Ustilaginei*.

UTANIA. A synonym of **Fagræa** (which *see*).

UTRICLE. A small, bladdery pericarp; any thin, bottle-like body.

UTRICULAR, UTRICULATE, UTRICULIFORM, UTRICULOSE. Having, or consisting of, utricles; bladder-like.

UTRICULARIA (from *utriculus*, a little bottle; alluding to the minute, pitcher-like bodies developed on the leaves and roots). Bladderwort; Hooded Water Milfoil. ORD. *Lentibularieæ*. A large genus (nearly 150 species) of cosmopolitan, stove, greenhouse, or hardy, floating, epiphytal (*e.g.*, *montana*), or terrestrial herbs. Calyx two-parted or deeply two-lobed; corolla spur often incurved; upper lip erect, entire, emarginate, or bifid; lower one often large and spreading, three to six-lobed; scape simple or slightly branched, one-flowered or bearing a many-flowered raceme. Leaves of the floating species many-partite, with capillary segments, furnished with minute pitchers, which entrap animalcules; those of the erect species entire. *U. intermedia*, *U. minor*, *U. neglecta*, and *U. vulgaris*, are worthy of being grown as curiosities. The first thrives in shallow pans of water in which sphagnum has been established, and the other three in deeper vessels; towards winter, all four form compact, round winter buds—at the ends of the branches—which fall to the bottom of the water and remain there until the following spring. *U. Endresii* and *U. montana* do best in baskets of fibry peat and sphagnum, suspended near the glass. *U. Humboldtii* and *U. reniformis* will grow in large pots of peat and sphagnum, partially plunged in water. *U. bifida* thrives in a pot of ordinary soil, placed a few inches below the surface of a warm tank.

U. bifida (bifid).* *fl.*, corolla bright yellow, with a very large and prominent, hemispheric, orange-yellow palate, the upper lip reflexed, the lower very short and two-lobed; scapes numerous, erect, two to five times as long as the leaves. September. *l.* erect, 1in. to 2in. long, filiform or slightly thickened upwards, bright green. Hong Kong, 1882. Plant densely tufted. Greenhouse. (B. M. 6689.)

U. Endresii (Endres').* *fl.* drooping, on very slender pedicels; sepals pale greenish or reddish, ¼in. to ⅜in. long; corolla pale lilac, with a yellow palate, 1½in. to 2in. in diameter, beautifully ciliolate all round; scape twice as long as the leaves, erect, about five-flowered. Spring. *l.* solitary, 1in. to 3in. long, narrowly elliptic-lanceolate, narrowed into stiff petioles of the same length. Rhizomes slender, creeping, bearing ovoid tubercles ¼in. long. Costa Rica, 1874. Stove. (B. M. 6656.) SYN. *U. montana rosea* (of gardens).

U. Humboldtii (Humboldt's).* *fl.* bluish-purple, large, terminal, racemose, on short pedicels; sepals dark fuscous, leafy, convex, ovate, acute; upper lip of the corolla small, entire, slightly inflexed at apex, the lower one dilated, truncate, yellow and excavated at base; spur subulate, ascending-decurved; scape very long, glabrous, sparsely bracteate. *l.* usually solitary, obcordate, attenuated into a long petiole. Root fibrous. Guiana, 1886. Stove. (F. d. S. 1390.)

U. intermedia (intermediate). *fl.* pale yellow; upper lip of the corolla far exceeding the palate; scape rather stout, three or four-flowered. July to September. *l.* distichous, closely set, ⅛in. to ¼in. broad, orbicular, dichotomously multifid; segments subulate, distinctly ciliated; pitchers on leafless branches, ⅛in. to ¼in. long. Stems slender, 4in. to 8in. long. Europe, &c. (Sy. En. B. 1127.)

U. minor (lesser). *fl.* pale yellow; corolla ⅛in. long, with a minute, obtuse spur; scapes 2in. to 6in. long, bearing two to six flowers. June to September. *l.* lax, ⅛in. to ¼in. broad, orbicular, dichotomously multifid; segments subulate, quite entire; pitchers on the leaf axils, one line long. Stems capillary, 3in. to 10in. long. Europe, &c. (Sy. En. B. 1126.)

U. montana (mountain-loving).* *fl.* one to four, 1½in. in diameter; calyx lobes pale green, ovate-cordate, obtuse; corolla white, with a yellow palate and disk to the lower lip; upper lip with recurved edges, the lower one twice as large; spur a stout, incurved horn; scape much longer than the leaves, erect. July. *l.* 4in. to 6in. long, erect, elliptic-lanceolate, narrowed into slender

Utricularia—*continued.*

petioles. ☻ Roots of ovoid, stalked, hollow, green tubers, ¼in. to ½in. long. West Indies, 1871. Stove epiphyte. (B. M. 6923; F. d. S. 1942; F. M. n. s. 83; G. C. 1871, 1039; I. H. n. s. 64.)

U. m. rosea (pink). A garden synonym of *U. Endresii.*

U. neglecta (neglected). *fl.* pale yellow; upper lip of corolla exceeding the palate; scape very slender. June to August. *l.* smaller than those of *U. vulgaris*, rather remote, nearly orbicular; segments entire. Stems capillary, 6in. to 8in. long. Europe (Britain). (Sy. En. B. 1125 *bis.*)

U. reniformis (kidney-shaped). *fl.* rose-coloured, with two darker-coloured lines, 1in. to 1¼in. across; scape 1½ft. to 2ft. long, many-flowered. *l.* reniform, sometimes 3in. across; petioles 6in. to 12in. long. Brazil, &c., 1886. A gigantic species.

U. vulgaris (common). *fl.* yellow; corolla ½in. to ¾in. long, with a conical spur; scape 4in. to 8in. long, two to eight-flowered. July and August. *l.* spreading, ¾in. to 1in. long, broadly ovate, pinnately multifid; segments remotely toothed; pitchers at the bases of and upon the leaf segments, ¼in. to ½in. long, shortly stalked. Stems 6in. to 18in. long, leafy. Europe (Britain), &c. (Sy. En. B. 1125.)

UTRICULARIEÆ. Included under *Lentibularieæ.*

UVARIA (from *uva*, a cluster of grapes; alluding to the fruits of some of the species). ORD. *Anonaceæ.* A genus embracing about thirty-five species of stove, climbing or sarmentose shrubs or under-shrubs, found in tropical Africa and Asia. Flowers yellow, purple, or brown, hermaphrodite, terminal or leaf-opposed, rarely axillary; sepals three, often connate below, broad, valvate; petals six, imbricated in two rows, sometimes connate at base; stamens indefinite. Leaves alternate, entire, exstipulate. Several species formerly included here are now referred to other genera. *U. Kirkii* is a medium-sized under-shrub, and *U. zeylanica* a large, woody climber. Both thrive in a compost of sandy loam and peat. Cuttings of the ripened wood will root in sand, under a glass, in heat.

U. Kirkii (Kirk's). *fl.* 3in. in diameter, solitary, axillary and sub-terminal; petals pale, dirty straw-colour, suffused with verdigris-green. October. *l.* 1½in. to 5in. long, the young ones elliptic-oblong, and very rusty beneath, the old ones oblong, obtuse or acute, glabrous beneath or with scattered hairs on the midrib; petioles very short. Branchlets ferruginously hairy. *h.* 3ft. to 4ft. Zanzibar, 1868. (B. M. 6006.)

U. zeylanica (Cingalese). *fl.* dull red, solitary or twin, 1in. in diameter; peduncles ½in. long, tomentose. May. *l.* lanceolate or oblong-lanceolate, acute or acuminate, 2½in. to 3½in. long, dark shining green on the upper side, red or pale beneath. *h.* 20ft. Ceylon, &c., 1794.

UVULARIA (from *uvula*, a diminutive of *uva*, a grape, or bunch of grapes; in allusion to the form of the fruit). Bellwort. Including *Oakesia* (of Watson). ORD. *Liliaceæ.* A small genus (four or five species) of hardy, bulbous plants, natives of North America. Flowers solitary or twin at the tips of the branchlets, on rather long, pendulous pedicels; perianth usually pale yellow, campanulate, deciduous, the segments distinct, erect, or spreading above, the outer ones foveolate within at the base; stamens six. Leaves alternate, sessile or perfoliate, ovate or lanceolate. The species thrive in a light, sandy soil, and may be increased by divisions. All flower in spring.

U. flava (yellow). A variety of *U. perfoliata.*

U. grandiflora (large-flowered).* *fl.* one to three, on pedicels ½in. to ¾in. long; perianth 1½in. to 1¾in. long, the segments lanceolate, acute, three to four lines broad; anthers six to eight lines long. *l.* oblong, membranous, perfoliate, glabrous, 2in. to 4in. long. 1802. Habit that of *U. perfoliata*, but rather more robust. (B. M. 1112; S. E. B. i. 51.)

U. lanceolata (lanceolate-leaved). A form of *U. perfoliata.*

U. perfoliata (perfoliate). *fl.* one or few, drooping, terminal; perianth ¾in. to 1¼in. long, the segments lanceolate, acute, papillose within. *l.* six to twelve, perfoliate, oblong, sub-acute, membranous, 1½in. to 3in. long, green above, paler beneath. Stems forked above. *h.* nearly 1ft. 1710. (B. M. 555; S. E. B. i. 49.) *U. flava* (S. E. B. i. 50) is a variety with larger and deeper-coloured flowers. ☻ *U. lanceolata* is merely a narrow-leaved form.

U. puberula (puberulous). *fl.* few, terminal or axillary, on pedicels ½in. to ¾in. long; perianth nearly 1in. long. *l.* six to

Uvularia—*continued.*

fifteen, oblong, sessile, 1½in. to 2in. long, acute or cuspidate, firmer than in the other species, green on both sides, the margins ciliated. Stem nearly 1ft. high, with two to four branches. 1824. (S. B. F. G. ser. ii. 21.)

U. rosea (rosy). A synonym of *Streptopus roseus.*

U. sessilifolia (sessile-leaved).* *fl.* one to three, axillary or terminal, on pedicels ½in. to ¾in. long; perianth ¾in. to 1in. long, the segments lanceolate. *l.* six to fifteen, oblong, sessile, membranous, acute, 1½in. to 3in. long, narrowed at base, slightly glaucous below. Stem glabrous, nearly or quite 1ft. high; branches two to four. 1790. (B. M. 1402; L. B. C. 1262; S. E. B. i. 52.)

VACCARIA. Included under **Saponaria** (which *see*).

VACCINIACEÆ. A natural order of erect or prostrate shrubs or small trees, often epiphytal, usually inhabiting North temperate regions, but many are South American and Indian; they also occur in Asia, Africa, Madagascar, and Australia. Flowers hermaphrodite, variously disposed; calyx tube adnate to the ovary, the limb five, rarely four to seven, parted; corolla gamopetalous, globose, campanulate, tubular, or inflated, five, rarely four to seven, lobed, or very rarely four or five-parted, the lobes imbricated, rarely valvate; stamens twice as many as, or rarely equalling in number, the corolla lobes, epigynous or adhering towards the base of the corolla; filaments free or connate; anthers two-celled. Fruit baccate, rarely drupaceous, or dry, often very fleshy. Leaves alternate or scattered, occasionally distichous, sessile or petiolate, usually evergreen, entire, crenated, or serrated, the teeth sometimes glanduliferous. The berries of *Vaccinium* and *Oxycoccus* are acid, sweet, and slightly astringent; preserves are made of them, and in some countries they are used as anti-scorbutics. The order embraces twenty-six genera, and about 320 species. Examples: *Cavendishia, Psammisia, Themistoclesia, Thibaudia*, and *Vaccinium.*

VACCINIUM (the old Latin name, used by Virgil and Pliny). Bilberry; Blueberry; Cranberry; Huckleberry. Including *Epigynium* (in part). ORD. *Vacciniaceæ.* A large genus (about 100 species) of mostly hardy, branched shrubs, rarely trees, very rarely epiphytal, inhabiting North temperate regions and tropical mountains. Flowers white, pink, or red, disposed in axillary or terminal racemes or axillary fascicles, rarely solitary, often bracteate and bibracteolate; calyx tube terete, globose, hemispherical, or turbinate, the limb of four or five short, very rarely unequal lobes; corolla urceolate, campanulate, or rarely nearly tubular or conical, terete, very rarely ribbed or angled, the limb of four or five short, rarely elongated and revolute lobes or teeth; stamens eight or ten, free, or shortly adhering at the base of the corolla tube; filaments short or elongated, often hairy; anthers awned on the back or awnless; bracts sometimes foliaceous. Berry globose, four or five (or apparently eight or ten) celled, the cells few or many-seeded. Leaves persistent, rarely membranous or deciduous, often thickly coriaceous, entire or serrated. All the Vacciniums require peat; the hardy ones thriving in any fairly damp, peat border. They may be propagated most readily from seeds, sown under glass, in spring, and the seedlings gradually hardened off when large enough. The greenhouse species should be placed in the open air during the summer months, in order to get their wood well ripened. The best-known species are here described. Except where otherwise indicated, they are hardy, deciduous shrubs, from North America; the flowers appear in spring, and the berries, which are sweetish or sometimes acid, and mostly edible, ripen in summer or autumn.

V. albiflorum (white-flowered). A synonym of *V. corymbosum pallidum.*

V. amœnum (pleasing). A variety of *V. corymbosum.*

Vaccinium—*continued.*

V. angustifolium (narrow-leaved). A form of *V. pennsylvanicum.*

V. arboreum (tree-like). Farkleberry. *fl.* profuse, axillary along the branches and leafy-racemose; corolla white, moderately five-lobed. *fr.* black, small, globose. *l.* obovate or round-oval to oblong, thinnish-coriaceous, very smooth and shining above, reticulate-veined, obscurely glandular-denticulate or entire. Branches spreading, glabrous or somewhat pubescent. *h.* 6ft. to 25ft. 1765. (L. B. C. 1885.) SYN. *V. diffusum* (B. M. 1607)

V. Arctostaphylos (Arctostaphylos). A synonym of *V. maderense.*

Vaccinium—*continued.*

V. caracasanum (Caraccas).* *fl.* secund, with eight to ten anthers; corolla reddish-white, campanulate; racemes axillary, twice as long as the leaves; bracts lanceolate, nearly equalling the pedicels. July. *l.* elliptic, acute, crenulate, coriaceous, glabrous, shining above. Stem shrubby, erect. *h.* 4ft. Caraccas, 1825. Greenhouse.

V. corymbosum (corymbose).* *fl.* more often racemosely than corymbosely disposed on the naked twigs; corolla white or obscurely rose-coloured, turgid-ovate to cylindraceous-campanulate, three to four lines long. *fr.* usually blue-black, with a copious bloom. *l.* ovate or oblong to elliptic-lanceolate. Branchlets yellowish-green, turning brownish. *h.* 5ft. to 10ft. 1765.

FIG. 146. FRUITING BRANCH OF VACCINIUM LEUCOBOTRYS.

V. cæspitosum (tufted). *fl.* solitary in the earliest axils, usually five-parted; corolla rose-coloured or nearly white, ovate or ovoid-oblong. *fr.* blue, with a bloom, proportionately large, sweet. *l.* obovate to cuneate-oblong, obtuse or rarely somewhat acute, thickly serrulated, bright green on both sides, reticulate-veined. *h.* 3in. to 6in. 1823. (B. M. 3429; H. F. B. A. ii. 126.)

V. canadense (Canadian). *fl.* few in the clusters; corolla greenish-white, shorter, and more open-campanulate. *l.* elliptic or oblong-lanceolate, entire, and, as well as the branchlets, downy with soft, spreading pubescence. Otherwise resembling *V. pennsylvanicum.* 1825. (B. M. 3446.)

V. c. amœnum (pleasing). *l.* ciliate-serrulated or bristly-ciliated, rather bright green, slightly or sparsely pubescent. SYNS. *V. amœnum* (A. B. R. 138; B. R. 400), ? *V. c. fuscatum* (B. M. 3433).

V. c. pallidum (pale). A pale and very glaucous or glaucescent form, with or without some pubescence, generally low; otherwise nearly as in the preceding variety. SYN. *V. albiflorum* (B. M. 3428).

V. crassifolium (thick-leaved). *fl.* few and almost sessile, in small, axillary clusters; corolla nearly white, globose, campanulate. *fr.* black. *l.* ¼in. to ½in. long, oval to narrow-oblong,

Vaccinium—*continued.*

sparsely mucronate-serrulate or entire, shining. Stems slender. trailing, 2ft. to 3ft. long. 1787. Evergreen. (A. B. R. 105; B. M. 1152.)

V. diffusum (diffuse). A synonym of *V. arboreum.*

V. dumosum (bushy). A synonym of *Gaylussacia dumosa.*

V. erythrinum (red-twigged).* *fl.* numerous, moderately large, secund, drooping; corolla deep coral-red, urceolate, the limb of five small, reflexed segments; pedicels red; racemes clustered, terminal, 2½in. to 3in. long, sessile or nearly so. October. *l.* alternate, coriaceous, glossy, 1½in. to 2in. long, ovate, rather obtuse, quite entire; young ones stained with red. Young branches red. *h.* 1½ft. Java, 1852. A handsome, warm greenhouse, evergreen shrub. (B. M. 4688; F. d. S. 1115; L. J. F. iv. 364.)

V. formosum (beautiful).* *fl.* in loose clusters; calyx and tardily deciduous bracts red or reddish; corolla rose-red, four to five lines long, cylindrical. *fr.* blue, sweet. *l.* ovate or oblong, entire, 1in. to 2in. long, smooth and bright green above, glabrous or pubescent beneath, rather firm in texture. *h.* 2ft. to 3ft. (A. B. R. 97.)

V. frondosum (leafy). A synonym of *Gaylussacia frondosa.*

V. fuscatum (fuscous). A form of *V. virgatum.*

V. Imrayi (Dr. Imray's). *fl.* large; corolla yellow-green, rather thick; corymbs many-flowered, axillary or terminal, leafy, compact. *l.* shortly petiolate, ovate, acuminate, entire or obsoletely serrated, penninerved, glossy, coriaceous. *h.* 2½ft. to 3ft. Dominica, 1860. A handsome, stove, evergreen shrub. (B. M. 5279.) The correct name of this plant is now *Hornemannia martinicensis.*

V. leucobotrys (white-clustered).* *fl.* glabrous; corolla white, waxy, sub-diaphanous, conico-urceolate; racemes copious from among the leaves, and longer than them, drooping, secund, many-flowered. Summer. *fr.* pure white, with five dark spots in a circle below the apex, copious, about the size of peas. *l.* oblong-lanceolate, deeply serrated, very shortly petiolate. Branches whorled. *h.* 4ft. to 7ft. Bengal, 1859. Greenhouse, evergreen shrub. See Fig. 146. (B. M. 5103, under name of *Epigynium leucobotrys.*)

V. leucostomum (white-mouthed). *fl.* three or four in a short, erect, fascicled raceme; corolla scarlet, tipped with white, urceolate-campanulate, with a short limb; bracts small, subulate. *l.* oblong, nearly sessile, thick, slightly crenate, obsoletely nerved, ½in. to 1in. long. Branches erect, angled. Peruvian Andes, 1848. A glabrous, evergreen shrub. (G. C. 1848, p. 7.)

V. macrocarpum (large-fruited). A synonym of *Oxycoccus macrocarpus.*

V. maderense (Madeira). *fl.* on axillary, drooping pedicels; corolla greenish-white, campanulate, sub-cylindrical; racemes leafy. *l.* oblong, attenuated at both ends, serrulated, pubescent beneath. Stem arborescent. *h.* 6ft. Madeira, 1777. SYN. *V. Arctostaphylos* (A. B. R. 30; B. M. 974).

V. Mortinia (native name).* *fl.* in very short, drooping racemes, crowded, shortly pedicellate; corolla rose-pink, ½in. long, with five small, recurved teeth. *l.* rather crowded, ½in. to ¾in. long, spreading and reflexed, ovate- or lanceolate-oblong or ovate, acute, thickly coriaceous, slightly serrated; petioles very short. Branches pubescent or nearly glabrous. *h.* 2ft. to 3ft. Andes, 1884. Half-hardy shrub. (B. M. 6872.)

V. Myrsinites (Myrsinites). *fl.* in fascicles or very short racemes, shortly pedicellate; corolla white or rose-coloured, five-toothed, at length cylindraceous, two to three lines long; bracts reddish, tardily deciduous. *fr.* blue, globose. *l.* obovate and obtuse to oblong-lanceolate and acute or spathulate, often cuspidate, ½in. to 1in. long, sometimes denticulate, mostly shining above, dull or paler and sometimes glaucous beneath. Branchlets puberulent when young. *h.* 9in. to 2ft. 1794. Evergreen. (? B. M. 1550, under name of *V. nitidum decumbens.*) SYN. *V. Sprengelii* (of gardens).

V. myrtilloides (Myrtillus-like). *fl.* solitary in the earliest axils, usually five-parted; corolla yellowish- or greenish-white, tinged with purple, globose-urceolate, nearly two lines long. *fr.* purplish-black, rather acid. *l.* ovate or oval and oblong, sharply serrulated, membranous, green on both sides but not shining, 1in. or more long, the larger or later ones mostly acute or acuminate. Branchlets slightly angled. *h.* 1ft. to 5ft. (B. M. 3447.)

V. Myrtillus (Myrtillus). Bilberry; Bleaberry; Blueberry; Common Whortleberry, &c. *fl.* solitary, on naked peduncles, ½in. long; corolla rosy, tinged with green, globose, ½in. in diameter. *fr.* dark blue, ½in. in diameter, glaucous. *l.* ovate, ½in. to 1in. long, serrated, reticulate-nerved, rosy when young. Stems many, erect, 6in. to 2ft. high. Europe (Britain), Asia, and America. (F. D. 974; Sy. En. B. 879.)

V. nitidum (shining). *fl.* in fascicles or very short racemes; calyx teeth and almost persistent bracts very obtuse; corolla rose-red or turning white, rather broad, two lines long. *fr.* black, somewhat pear-shaped. *l.* obovate to oblanceolate-oblong, ½in. to ½in. long, thick-coriaceous, shining, at least above, obscurely denticulate and glandular. *h.* 1ft. to 2ft. 1794. A diffuse, much-branched, very leafy, evergreen shrub. (A. B. R. 480.)

Vaccinium—*continued.*

V. ovatum (ovate-leaved). *fl.* in short and close, axillary clusters; corolla rose or flesh-coloured, campanulate, two lines long, five-parted. *fr.* reddish, turning black, small, rather sweet. *l.* thick and firm, very numerous, oblong-ovate to oblong-lanceolate, acute, minutely and acutely serrated, glabrous or nearly so, 1in. or so long, bright green on both sides. Branchlets pubescent. *h.* 3ft. to 5ft. 1826. An erect, rigid, evergreen shrub. (B. R. 1354; L. B. C. 1605; L. J. F. iv. 424.)

V. Oxycoccus (Oxycoccus). A synonym of *Oxycoccus palustris.*

V. pennsylvanicum (Pennsylvanian).* *fl.* on very short pedicels, in fascicles or short racemes; corolla white or obscurely rose-coloured, campanulate with the orifice slightly contracted, barely ⅛in. long. *fr.* bluish-black and glaucous, large and sweet, ripening early. *l.* oblong-lanceolate or oblong, green and somewhat shining on both sides, glabrous or sometimes hairy on the midrib beneath, distinctly serrulated with bristle-pointed teeth. Stems green and warty, mostly glabrous. *h.* 9in. to 12in. or more. 1772. (B. M. 3434.)

V. p. angustifolium (narrow-leaved). Bluets. A dwarf form (9in. or less in height), with lanceolate leaves. SYN. *V. angustifolium.*

V. reflexum (reflexed-leaved). *fl.* corolla red, coriaceous, rather acutely five-angled; corymbs small, short, few-flowered, or many-flowered and then sub-globose, sub-terminal and axillary. January. *l.* small, reflexed or horizontally spreading, ⅛in. to ¾in. long, almost sessile, oblong-lanceolate, acute, sharply serrated except at the base; young ones bright pale red. Stem branched from the base; branches 1ft. to 2ft. long, sparingly divided, leafy, pendulous. Bolivia, 1869. Greenhouse evergreen. (B. M. 5781.)

V. resinosum (resinous). A synonym of *Gaylussacia resinosa.*

V. Rollisoni (Rollison's). *fl.* on spreading pedicels, drooping; corolla rich scarlet, the limb of five acute lobes; racemes always terminal, nearly sessile, four to six-flowered. *l.* about ¾in. long, obovate, sub-cuneate, coriaceous, glossy, entire, sometimes retuse. Branchlets angled. *h.* 2ft. or more. Java, 1851. An erect, much-branched, slightly hairy, leafy, stove, evergreen shrub. (B. M. 4612.)

V. rugosum (wrinkled). A synonym of *Pentapterygium rugosum.*

V. Sprengelii (Sprengel's) A garden synonym of *V. Myrsinites.*

V. stamineum (thready).* Deerberry; Squaw Huckleberry. *fl.* nearly all axillary; corolla dull purplish or yellowish-green, deeply five-cleft; awns of the anthers very much shorter than the elongated tubes. *fr.* greenish or yellowish, large, pear-shaped or globular, mawkish. *l.* pale and dull or glaucous, especially beneath, oval to lanceolate-oblong. Branches diverging, minutely pubescent or at length glabrous. *h.* 2ft. to 3ft. 1772. (A. B. R. 263.)

V. tenellum (tender). A variety of *V. virgatum.*

V. uliginosum (swamp-loving). *fl.*, corolla pale pink, ⅛in. long sub-globose; peduncles one to three together, ⅛in. long, one-flowered. *fr.* smaller than in *V. Myrtillus.* *l.* oblong or obovate, ½in. to 1in. long, obtuse or acute, quite entire, coriaceous, glaucous beneath. Stems 6in. to 10in. long, naked below, procumbent; branches ascending. Arctic regions of Northern hemisphere. (F. D. 231; Sy. En. B. 878.)

FIG. 147. FLOWERING BRANCH OF VACCINIUM VITIS-IDÆA.

Vaccinium—*continued.*

V. virgatum (twiggy). *fl.* on short pedicels; corolla rose-coloured, three to four lines long; clusters sometimes twiggy on naked branches. *fr.* black, sometimes with a bloom. *l.* ob-ovate-oblong to cuneate-lanceolate, or oblong-lanceolate, usually acute or pointed and minutely serrulated, rather thin, 1in. or so long. *h.* 3ft. Shrub more or less pubescent. (A. B. R. 181; B. M. 3522; W. D. B. i. 33, 34.) *V. fuscatum* (B. R. 302) is a form of this species, having deep rose-coloured flowers and red pedicels and bracts, approaching *V. formosum.*

V. v. tenellum (tender). *fl.* nearly white, in shorter or closer clusters; corolla barely ¼in. long. *l.* mostly small. A low form.

V. Vitis-Idæa (Vine of Mount Ida).* Brawlins; Cowberry; Flowering Box, &c. *fl.* crowded in short, terminal, drooping racemes; corolla pink, campanulate. *fr.* red, globose, ¼in. in diameter, acid. *l.* obovate, ½in. to 1¼in. long, green above (like Box), dotted beneath, very coriaceous, bifarious, the margins revolute, thickened, entire or minutely serrulated. Stems wiry, tortuous, procumbent; branches 6in. to 18in. long, trailing or ascending. Europe (Britain). Evergreen. See Fig. 147. (F. D. 40; Sy. En. B. 877.)

VACUOUS. Empty; a term applied to cases when an organ does not contain what usually belongs to it. Bracts which usually support flowers are said to be Vacuous when they have no flowers in their axils.

VAGIFORM. Having no certain figure.

VAGINA. A sheath; *e.g.*, a petiole rolled round a stem.

VAGINATE. Sheathed.

VAGINULARIA. Included under *Monogramme.*

VAILLANTIA (named in honour of Sebastian Vaillant, 1669-1722, an eminent French botanist, author of "Botanicon Parisiense"). SYN. *Valantia.* ORD. *Rubiaceæ.* A genus including two or three species of small, branched, annual herbs, natives of South Europe, the Mediterranean region, and Western Asia. Flowers white or yellow, small, ternate. Leaves in whorls of four, lanceolate or obovate. The species are of no interest from a horticultural standpoint.

VALANTIA. A synonym of **Vaillantia** (which *see*).

VALDESIA. A synonym of **Blakea** (which *see*).

VALDIVIA (so called from the town of Valdivia, in Chili, in the neighbourhood of which the genus is found). ORD. *Saxifrageæ.* A monotypic genus. The species is a singular and ornamental, small, half-hardy, evergreen shrub, with short, terete stems, probably now lost to cultivation.

V. Gayana (Gay's). *fl.* red, pedicellate, few in a short, axillary, hairy raceme; calyx five-lobed, the tube adnate with the ovary; petals five to seven, perigynous, linear, acuminate, bearded within at the base; stamens five to seven. *l.* ample, alternate and sub-opposite, obovate-lanceolate, acute, argutely glandular-erose or toothed, membranous; stipules wanting. *h.* 6in. Chili to Valdivia, 1863.

VALERIAN. *See* **Valeriana.**

VALERIANA (a mediæval name, said to be derived from *valere,* to be healthy; in allusion to its powerful medicinal qualities). Valerian. ORD. *Valerianeæ.* A large genus (nearly 150 species) of mostly hardy, perennial herbs, sub-shrubs, or shrubs, mostly inhabiting North temperate regions and extra-tropical South America; a few are natives of Brazil or the East Indies. Flowers white or pink; calyx at first entire, but forming a feathery crown at fruiting time; corolla with a short or rarely elongated tube and a five-cleft, spreading limb; stamens three, rarely one or two by abortion. Fruit compressed. Leaves, especially the radical ones, entire or toothed, or the cauline ones (or all) pinnatifid, or once, twice, or thrice pinnatisect. Few of the species have any horticultural merit. The medicinal qualities of *V. officinalis* are, however, extensive. Those described below are hardy perennials; they thrive in common soil, and may be readily increased by divisions.

V. angustifolia (narrow-leaved). A synonym of *Centranthus angustifolius.*

Valeriana—*continued.*

V. Calcitrapa (Calcitrapa). A synonym of *Centranthus Calcitrapa.*

V. Cornucopiæ (Cornucopia). A synonym of *Fedia Cornucopiæ.*

V. dioica (dicœcious). Marsh Valerian. *fl.* pale rose-coloured, mostly unisexual, in terminal corymbs; corolla tube short. Early summer. *l.*, radical ones and those of the runners long-stalked, ovate, entire, ½in. to 1in. long; cauline ones few, mostly pinnate, with one terminal segment and several pairs of smaller ones, all entire. Flowering stems 6in. to 8in. high. Europe (Britain). (Sy. En. B. 668.)

V. montana (mountain-loving). *fl.* pink; corymbs at length paniculate. July. *l.*, lower ones oblong or obovate, obtuse, slightly toothed; upper ones lanceolate, acute. *h.* 9in. Mountains of Europe, 1748. Plant glabrous or slightly pilose, erect. (J. F. A. 269; L. B. C. 317.)

V. m. rotundifolia (round-leaved). *l.*, lower ones nearly round. Stems dwarfer than in the type. (B. M. 1825.)

FIG. 148. VALERIANA OFFICINALIS, showing (*a*) Upper Portion of Plant; (*b*) Flower, with Corolla removed; (*c*) Corolla, cut open; (*d*) Plumose Crown of Fruit.

V. officinalis (officinal). All-heal; Common Valerian; St. George's Herb, &c. *fl.* pink; corymb contracted or loose, at length sub-paniculate. June. *l.* all, or nearly all, pinnatisect; segments seven or eight pairs, lanceolate, serrated. Stems sulcate. *h.* 3ft. Europe. A very variable species. See Fig. 148. (B. M. Pl. 146; F. D. 570; Sy. En. B. 666.)

V. Phu. *fl.* white, in a paniculate corymb. August. *l.*, radical ones oblong or elliptic, undivided; cauline ones pinnately lobed, the lobes oblong. Stem terete, smooth. *h.* 2ft. Caucasus (an escape from cultivation in Europe). Plant glabrous, erect.

V. P. aurea (golden).* This only differs from the type in the bright golden-yellow colour of the young growths in spring.

V. ruthenica (Russian). A synonym of *Patrinia sibirica.*

V. sibirica (Siberian). A synonym of *Patrinia sibirica.*

VALERIANEÆ. A natural order of annual or perennial herbs, sub-shrubs, or rarely shrubs, mostly found in temperate and frigid regions of the Northern hemisphere, copious in Western America and the Andes, rarely found in tropical Asia, Brazil, Guiana, and the West Indies. Flowers cymose or solitary; calyx tube adnate to the ovary, often small, sometimes obsolete; corolla white, pale blue, red, or (in *Patrinia*) yellow, superior, gamopetalous, the base of the tube often attenuated, gibbous or spurred, the limb spreading, three to five-cleft or bilabiate; stamens one to four, inserted below or above the middle of the tube, often exserted; filaments free; anthers two-celled; cymes terminal or axillary, clustered, or loosely corymbose or paniculate. Fruit dry, indehiscent. Leaves opposite, exstipulate, often mostly radical or clustered at the base of the stem, entire or toothed; cauline ones sometimes few, small, or wanting, sometimes many, entire, or often as large as the radical ones, and toothed, pinnatifid, or once, twice, or thrice pinnatisect. The medicinal qualities of *Valerianeæ* have been known from ancient times; the plants now take rank at the head of the vegetable anti-

Valerianeæ—*continued.*

spasmodics. The order includes nine genera, and about 300 species. Examples: *Centranthus, Nardostachys, Patrinia, Valeriana.*

VALERIANELLA (a diminutive of *Valeriana*). SYNS. *Fedia* (of Gærtner), *Odontocarpa, Polypremum* (of Adanson). ORD. *Valerianeæ*. A genus comprising about fifty species of small, hardy, dichotomously-branched, annual herbs, natives of Europe, North Africa, West Asia, and North America. Flowers whitish, pale bluish, or pink; calyx limb toothed, lobed, or wanting; corolla tube short or rarely elongated, the limb spreading, five-cleft; stamens three; cymes sometimes fastigiately corymbose-paniculate, sometimes densely globose at the tips of the branches; bracts free. Radical leaves rosulate, entire; cauline ones entire, toothed, or rarely incised-pinnatifid. *V. carinata* and *V. olitoria* are the only species calling for description in this work. For cultural directions, &c., *see* **Corn Salad.**

V. carinata (keeled). Corn Salad. *fr.* oblong, boat-shaped; fertile cell not corky; calyx limb indistinct. Europe (Britain). Sir J. D. Hooker regards this as "probably a variety of *Fedia olitoria*, which it resembles in all characters save those of the fruit."

V. olitoria (culinary). Common Corn Salad; Lamb's Lettuce; White Potherb. *fl.* pale lilac, minute, in capitate cymes. April to June. *fr.* minute, glabrous or hairy; fertile cell corky on the back, the empty ones contiguous or confluent; calyx limb wanting. *l.* 1in. to 3in. long, linear-oblong or oblong-lanceolate, quite entire or toothed; cauline ones half-amplexicaul. *h.* 6in. to 12in. Europe (Britain), &c. An excellent salad. *See also* **Corn Salad.**

VALERIAN, GREEK. A common name for **Polemonium cæruleum** (which *see*).

VALERIAN, LONG-SPURRED. A common name for **Centranthus macrosiphon** (which *see*).

VALERIAN, RED OR SPUR. *See* **Centranthus ruber.**

VALERIANWORTS. The plants of the natural order *Valerianæ.*

VALLARIS (perhaps from *vallo*, to inclose; the plants are said to be used in Java for fences). SYNS. *Emericia, Peltanthera.* ORD. *Apocynaceæ.* A small genus (five or six species) of tropical Asiatic and Malayan, stove, twining shrubs. Flowers white, cymose or fascicled; calyx five-parted, glandular or not within; corolla salver-shaped, with a short tube, a naked throat, and broad lobes; stamens at the top of the tube, the filaments very short, clavate. Leaves opposite, minutely dotted. For culture of *V. Pergularia*, the only species introduced, *see* **Vallesia.**

V. Pergularia (Pergularia). *fl.* with a disagreeable, goat-like smell; cymes glabrous or puberulous. *l.* broadly elliptic or obovate, or rounded abruptly, shortly acute, membranous, 4in. to 7in. long, 3in. to 4in. broad, glabrous or puberulous beneath; petioles 1in. to 1½in. long. Bark pale. India, 1818.

VALLESIA (name commemorative of Francisco Valles, physician to Philip II. of Spain; he died in 1592). ORD. *Apocynaceæ.* A small genus (two species) of American, much-branched, glabrous, stove shrubs or small trees. Flowers small, cymose; calyx five-parted, without glands; corolla salver-shaped, annulate or pilose within the throat, the lobes five, ovate or lanceolate, twisted; stamens included below the apex of the tube. Leaves alternate, lanceolate or oblong. It is doubtful whether *V. dichotoma* is still in cultivation. A compost of sandy loam and peat suits it. Propagation may be effected by means of cuttings, inserted in sand, under a glass, in heat.

V. dichotoma (dichotomous). *fl.* white, ¼in. long, numerous; cymes dichotomous, half the length of the leaves. May. *l.* ovate-oblong, acute, obtuse at base, 2in. to 2½in. long, rugose-tubercled and pellucid-dotted; young ones pubescent. Branches dichotomous, terete. *h.* 3ft. Peru, 1822.

VALLISNERIA (named after Antonio Vallisneri, 1661-1730, an Italian botanist, Professor at Padua). ORD. *Hydrocharideæ.* A monotypic genus. The species is a half-hardy, aquatic, submerged herb, found in fresh-water lakes, ditches, &c. It is largely grown in aquaria in this country, and requires to be planted deeply in the water.

V. spiralis (spiral). Eel Grass; Tape Grass. *fl.* white, minute, apparently forming an ovoid or globular head not quite so long as the diœcious, shortly bi- or trifid spathes. July. *l.* very long and narrow when the water is deep, short in shallow water, obtuse or acute and more or less minutely toothed at the ends, or sometimes perhaps quite entire. Stems very short, sometimes stoloniferous. Warm and temperate regions, 1818. The male flowers are borne on a very short peduncle, and are sessile on a conical axis. At the flowering period, the female peduncle gradually lengthens, so that the flower finally floats on the surface of the water. Then the male submerged flowers detach themselves spontaneously from their peduncle and rise to the surface. After fertilisation, the peduncle of the female flower contracts spirally, and the ovary descends to the bottom of the water to ripen its seeds.

VALLONEA OAK. *See* **Quercus Ægilops.**

VALLOTA (named after Pierre Valot, a French botanist, who wrote a description of the Royal Gardens in 1623). ORD. *Amaryllideæ.* A monotypic genus. The species is a beautiful, greenhouse, bulbous plant. It requires a soil composed of good, fibrous loam, leaf mould, and sand, in equal parts. The bulbs should be placed from 6in. to 8in. below the level of the surface of the soil, and surrounded with sand, after which they may be covered with the compost, which should be pressed firmly around them. They should not be disturbed for years, and will ultimately establish themselves and produce grand masses of blossom. The best season for planting a fresh stock is June and July, when they commence root action before the flower-stems are sent up. If the surface of the soil in which the bulbs are planted be covered with green Saxifrage or Sedum, it will give a very neat and pleasing appearance when the plants are in flower. During their growing season, and in dry weather, an occasional soaking of water or liquid manure will prove very beneficial to Vallotas.

V. purpurea (purple).* Scarborough Lily. *fl.* 3in. to 4in. long, several in an umbel, sessile or shortly pedicellate; perianth red, funnel-shaped, straight, erect, the tube short, the throat enlarged, the lobes oblong-ovate, connected at base by a small callus; stamens erect, equal; involucral bracts two or three, membranous; scape robust, fistular, 2ft. to 3ft. high. May. *l.* equalling the scape, lanceolate-linear, entire, obscurely reticulate-veined. South Africa, 1774. (R. H. 1870, 50.)

V. p. eximia (choice).* *fl.* of the same shade of colour as in the type, 4in. across, chiefly distinguishable for the white throat, with crimson feather, not unlike what is seen in some varieties of Gladioli. (F. M. ser. i. 225.)

V. p. magnifica (magnificent). This is hardly distinct from *V. p. eximia*, though its raisers consider it larger, brighter in colour, and a more robust grower than any other. It was exhibited with flowers 5in. across. (Gn. xxx., p. 245.)

V. p. major (greater). *fl.*, perianth reddish-scarlet, the throat hyaline-fenestrate; anthers longer. SYN. *Amaryllis purpurea* (B. M. 1430).

V. p. minor (lesser). *fl.*, perianth cherry-red, the throat opaque-fenestrate; anthers shorter. (B. R. 552.)

VALONIA. A commercial name for the acorn-cups of *Quercus Ægilops.*

VALVATE, VALVULAR. United by the margins only; opening as if by doors or valves, as do most indehiscent fruits and some anthers.

VALVES. The doors by which various bodies open; the term is also applied to the pieces into which a capsule splits.

VALVES. In all heating arrangements by hot water, Valves are requisite for regulating the passage of heat to different houses and pits, and for shutting it off altogether from any part when not required. The ordinary kind, which can easily be opened or closed with one

Valves—*continued.*

hand, answers very well for the mere purpose of regulating heat. A high-pressure Valve, the aperture in which is opened and closed by means of a screw and thread, is sometimes put in near the boiler when there is more than one main, or when two boilers are connected for working both together and separately. When these Valves are screwed down, the water cannot circulate or pass, and this is of great advantage in case of repairs being necessary to one of the boilers, as the other can meanwhile be kept at full work. High-pressure Valves are not required on all boilers, but sufficient of the ordinary kind should be introduced where necessary to insure the apparatus being worked readily and the regulation of heat kept under easy control.

VANDA (the Indian name of the original species). ORD. *Orchideæ*. A genus embracing about thirty species of very beautiful, stove, epiphytal Orchids, natives of the East Indies and the Malayan Archipelago, one being also found in tropical Australia. Flowers showy or rarely mediocre, shortly pedicellate, usually fragrant; sepals and petals free, sub-equal, much spreading, often narrowed or nearly clawed at base; lip continuous with the column, spreading, saccate or obtusely spurred at base, the lateral lobes erect, rounded or reduced to auricles, the middle one spreading; column short, thick, wingless; pollen masses two; bracts short; racemes simple, loose; peduncles lateral. Capsules often on rather long pedicels. Leaves distichous, spreading, coriaceous or slightly fleshy, often emarginate or shortly bilobed at apex, flat or (in *V. Hookeriana* and *V. teres*) terete. Stem leafy, not pseudo-bulbous. The Vandas require more light than most other Orchids; indeed, many successful growers do not use shading for them at all. During the period of growth, say from March or April until about October, a high temperature and abundance of moisture are essential: the thermometer should not fall below 70deg. or 75deg. during the day, and may be allowed to rise to 85deg. or even higher in sunny weather. The night temperature during the growing season should not fall more than about 10deg. below that maintained during the day. In the winter months, 60deg. or 65deg. at night will be sufficient, and less water will be required—none being allowed to lodge in the axils of the leaves. The most rational method of growing the plants is to fix them in baskets, filled three-fourths of their depth with broken potsherds, and the rest with clean, fresh sphagnum. If rafts or blocks of wood are employed, more care is necessary in watering, for, if an insufficient supply is given, the leaves are apt to shrivel and the lower ones to fall off. As pots are more readily moved, they are frequently employed by exhibitors; the directions as to cultivation in baskets should be followed if pots are used. *V. cærulea* requires less heat than the other kinds; indeed, it succeeds sometimes better under almost cool treatment. *V. teres* should be placed close to the glass, in a warm, sunny house, and supplied with abundance of water when growing; when at rest, less will suffice. Should the plants of any of the tall-growing species become too high, the tops may be cut off and potted in potsherds and sphagnum. New growths often spring from the base of the old plants, and from the stems of those which have been cut back; these allow the species to be readily propagated.

V. alpina (alpine). *fl.* pale green, small; sepals and petals oblong; lip yellowish, streaked with dull purple, gibbous below the apex, emarginate; basal hollow deep purple; raceme subsessile, erect, two or three-flowered. *l.* channelled, recurved, obliquely (sometimes acutely) bilobed. Khasya, 1837. SYN. *Luisia alpina.*

V. Batemanni (Bateman's). A synonym of *Stauropsis Batemanni.*

V. Bensoni (Benson's). *fl.* white outside, about 2in. in diameter; sepals and petals yellowish-green, dotted with reddish-brown on the inside, obovate, obtuse; lip pink, with a violet, reniform apex, ovate in front, convex, trilamellate on the disk, the small

Vanda—*continued.*

basal auricles and conical spur white; scapes rigid, 1½ft. high. *l.* coriaceous, lorate, channelled, toothed at apex. Rangoon, 1866. (B. M. 5611; F. d. S. 2329; G. C. 1867, 180.)

V. bicolor (two-coloured). *fl.* white externally, yellowish-brown inside, with obscure, livid tessellations, less than 2in. across; sepals and petals falcate; lip lilac, with large, white auricles, giving the base a broad, cordate appearance, dotted with lilac and tinged with yellow; raceme erect, rigid, few-flowered, longer than the leaves. *l.* lorate, coriaceous, half-twisted in the middle, very oblique and somewhat three-toothed at apex. Bhotan, 1875.

V. cærulea (blue).* *fl.* sometimes as much as 5in. across; sepals and petals pale blue, membranous, oblong, obtuse, shortly stalked; lip deep blue, small, coriaceous, oblong-linear, the point obtuse, with two diverging lobes; racemes ten or more-flowered; scapes erect, much longer than the leaves. Autumn. *l.* loriform, channelled, coriaceous, unequally truncate, with acute lateral lobes. Stem erect, 2ft. to 3ft. high. Khasya, 1849. A very handsome plant. (F. d. S. 609; I. H. 246; L. J. F. 102; L. & P. F. G. i. 36; R. X. O. i. 5; W. S. O. 18.) *V. c. grandiflora* is a fine, large-flowered variety. (R. H. 1881, p. 290.)

V. cærulescens (bluish) *fl.* ten to twenty on a slender, erect, axillary scape; sepals and petals pale mauve-blue, cuneate-ovate, twisted at the clawed base; lip violet, obcuneate, dilated, emarginate, with lilac-purple auricles, the spur tipped with green. Spring. *l.* coriaceous, ligulate, dark green, 5in. to 7in. long, truncately bilobed. Stems elongated. Burmah, 1869. A pretty little species. See Fig. 149 (for which we are indebted to Messrs. Veitch and Sons). (B. M. 5834; F. M. ser. ii. 256; G. C. 1870, p. 529; W. O. A. i. 48.)

V. c. Boxallii (Boxall's).* *fl.*, sepals and petals white, tinged with lilac; front lobe of the lip dilated, deep violet, bordered with white; disk dark blue-striped; raceme rather close, on a short scape. *l.* obliquely erose at apex. 1877. (B. M. 6328.)

V. c. Lowiana (Low's). Similar to *Boxallii*, but having an amethyst-coloured middle lobe of lip and a dot of amethyst at each end of the sepals. 1877.

V. Cathcarti (Cathcart's).* *fl.* 3in. across; sepals and petals white outside, yellow with reddish-brown bands internally, sessile, concave, roundish-oblong; lip three-lobed, the lateral lobes white, red-streaked at base, small, the middle lobe whitish, with a yellow, crenate, incurved border; disk with two erect calli; scape erect, leaf-opposed, four or five-flowered. *l.* 6in. to 7in. long, linear-oblong, unequally bilobed, pale green. Sikkim Himalayas, 1864. A tall, scrambling species. (B. M. 5845; C. H. P. 23; F. d. S. 1251-2; F. M. ser. ii. 66; G. C. 1870, 1409; I. H. 187; W. O. A. iv. 168.) *Arachnanthe Cathcarti* is now the correct name of this species.

V. concolor (one-coloured). *fl.* rather distant, numerous, in elongated, lateral racemes; sepals and petals white outside, cinnamon-brown within, oblong-obovate, wavy; lip three-lobed, downy at base, the side lobes white with rosy dots, the middle one cinnamon-brown, cuneate and bilobed at apex; spur attenuated. *l.* membranous, evergreen, lax, obliquely three-toothed at apex. Stems erect, 5ft. to 6ft. high. China, 1850. (B. M. 3416, under name of *V. Roxburghii unicolor.*)

V. cristata (crested). *fl.*, sepals and petals yellow-green, oblong, obtuse, the petals incurved; lip buff, striped with rich purple, divided at the end into two or three narrow, acute, diverging, unequal lobes; racemes erect, three to six-flowered, shorter than the leaves. March to July. *l.* channelled, recurved, truncate and three-toothed at apex. Stems erect. Nepaul, 1818. (B. M. 4304; B. R. 1842, 48; R. G. 680.)

V. Denisoniana (Denison's). *fl.* thick and fleshy, medium-sized; sepals and petals white, slightly tinged with green, the dorsal sepal and petals spathulate; lip white, pandurate; the apex two-lobed, the base with two nearly quadrate auricles; spur short, conical; racemes axillary, five or six-flowered, on stout, ascending peduncles. April. *l.* lorate, rigid, recurved, sharply bilobed at apex, dark green. Stems erect. Arracan Mountains, 1869. (B. M. 5811; F. & P. 1869, p. 250; G. C. n. s., xxiv., p. 105; I. H. ser. iii. 105.)

V. D. hebraica (Hebrew-marked). *fl.*, sepals and petals sulphur-coloured on both sides, but darker within and with spots and bars resembling Hebrew letters; anterior part of the blade of the lip olive-green; spur orange inside. July. Burmah, 1885. (W. O. A. 248.)

V. D. punctata (dotted). *fl.* sulphur-coloured, with some brown spots on the petals and odd sepal, the middle and base of the lip white.

V. densiflora (dense-flowered). A synonym of *Saccolabium giganteum.*

V. fuscoviridis (fuscous-green). *fl.* about 1½in. across, having a slightly fishy smell; sepals and petals dull brown, with a little greenish-yellow at the edge, the petals clawed, falcate, broader than the sepals; lip pure greenish-yellow, tomentose at base, five-furrowed, bilobed; spur cylindrical; racemes short, few-flowered. Spring. *h.* 1ft. Java, 1848. (G. C. 1848, p. 351; L. & P. F. G. ii. p. 20.)

V. gigantea (gigantic). A synonym of *Stauropsis gigantea.*

Vanda—*continued.*

V. Goweræ (Gower's). A garden name for *V. undulata.*

V. Griffithii (Griffith's). *fl.* yellow, brown, and lilac, much smaller than those of *V. cristata* (which this species resembles); sepals linear-oblong, recurved; petals acuminate; lip ovate, elongated, furrowed, concave at base. *l.* channelled, recurved, sharply and unequally three-lobed. Bhotan.

V. hastifera (halbert-bearing). *fl.* many in a loose raceme; sepals and petals light yellow, blotched with red inside; lip white, marked with brown and mauve, the lateral lobes semi-oblong, triangular, the front lobe halbert-shaped, covered with hairs at its base. *l.* linear-ligulate, erose at apex. Sondaic Archipelago, 1884. A rare, tall-growing Orchid.

V. helvola (pale red). *fl.* wine-red, shading into pale purple; lateral sepals connivent under the lip; lateral lobes of the lip bright purple, short, the middle lobe triangular-hastate, tumid inside and a little furrowed, concave beneath, the little sac having a pair of small callosities on the side opposite the column; raceme erect, shorter than the leaves, about three-flowered. March and April. *l.* rigid, slightly undulated, carinate at base, oblique and obtuse at apex. Java, 1850.

Vanda—*continued.*

V. Hookeriana (Hooker's).* *fl.* 2½in. across, membranous; sepals white, tinted with rose; petals larger, white, spotted with magenta, undulated, spathulate-oblong; lip cuneate at base, three-lobed, 1½in. broad, white, lined and spotted with magenta-purple; a large, deep purple auricle on each side of the column; raceme two to five-flowered; peduncle leaf-opposed. September. *l.* erect, 2in. to 3in. long, terete, pale green, subulate-pointed. Stems rooting, elongated, terete. Borneo. (I. H. ser. iii. 484; W. O. A. ii. 73.)

FIG. 149. VANDA CÆRULESCENS.

V. insignis (remarkable).* *fl.* 2½in. across; sepals and petals light brown, spotted with chocolate-brown internally, yellowish-white outside, obovate-spathulate; lip large, almost fiddle-shaped, the side lobes white, short, the front one white, suddenly expanding into a concave, semi-lunar limb of light purplish-rose racemes about as long as the leaves, five to seven-flowered. May and June. *l.* channelled, rigid, linear-ligulate, curving, unequally cut or denticulate at apex. Stems sub-erect. Moluccas, 1846. (B. M. 5759; L. & P. F. G. ii., p. 19; W. O. A. iv. 172; W. S. O. 3.)

V. i. Schröderiana (Baron Schröder's). *fl.*, sepals and petals light yellow; lip pure white, with a large, concave, anterior limb.

Vanda—*continued.*

Autumn. Malay Islands, 1883. A very chaste and distinct novelty.

V. lamellata (plated). *fl.* pale yellow, streaked with dull, pale red, in long, loose, erect racemes; sepals and petals obovate, undulated, the lower ones larger and slightly incurved; lip with two diverging, elevated lines, acute, obcuneate, retuse; auricles small, rounded; spur short, cylindrical-conical, hairy within. August. *l.* coriaceous, obliquely and acutely bidentate. Philippines, 1837.

V. l. Boxallii (Boxall's).* *fl.*, dorsal sepal creamy-white, the inner part of the lateral ones reddish-brown tinged with purple; petals white; limb of the lip rich magenta-rose towards the front, the disk with six reddish-purple stripes running back to the mouth of the tube; racemes fourteen to twenty-flowered. November and December. *l.* much recurved. Stems erect. 1880. (G. C. n. s., xv., p. 87; Gn. xix. 287.)

V. limbata (bordered). *fl.* 2in. across; sepals and petals cinnamon-brown, blotched and tessellated with darker reddish-brown, evenly bordered with yellow, tinged with lilac outside; lip rosy-lilac, margined with white, quadrate, slightly pandurate, the disk tumid, with five to seven parallel furrows; racemes loose, erect, about twelve-flowered. June. *l.* 8in. to 10in. long, channelled, coriaceous, obliquely retuse at apex. Stems stout, with long, thick roots. Java, 1875. (B. M. 6173; W. S. O. ser. iii. 9.)

V. Lindeni (Linden's). *fl.* disposed in a handsome raceme; sepals and petals light yellow, with red dots on the disk, cuneate-oblong, wavy; lip whitish-yellow, with nearly square side lobes and a triangular, two-edged middle lobe produced into a sharp angle under two tumours at the apex, sulcate beneath, with a linear, velvety, ascending auricle on each side at the base, and three furrows over the disk, the tumours and side-lobes purple-spotted, the disk marked with four purple lines, the tip under the tumours brownish; spur conical, hairy inside. Sunda Isles, 1886.

V. Parishii (Parish's).* *fl.* large; sepals and petals greenish-yellow, dotted with reddish-brown, cuneate-oblong, acute; lip strongly and peculiarly scented, the front lobe pale magenta, narrowly margined with white, rhomboid, gibbous below the apex, with a median keel and a violet, conical callus at base; spur short, gibbous; auricles white, orange-striped; scape erect, several-flowered. Summer. *l.* broadly ligulate, obtuse, unequally bilobed, fleshy, bright green. Moulmein, 1870. A handsome, dwarf species. (W. O. A. i. 15.)

V. P. Marriottiana (Sir W. H. S. Marriott's). *fl.* not scented; sepals and petals bronzy-brown, suffused with magenta; lip having a rich magenta, rhomboid front lobe and white basal auricles; raceme about six-flowered. *l.* slightly emarginate. Stems closely leafy. 1880. (W. O. A. ii. 61.)

FIG. 150. PORTION OF INFLORESCENCE OF VANDA PARVIFLORA.

V. parviflora (small-flowered). *fl.*, sepals and petals pale yellow, oval; lip funnel-shaped, the broadly oblong, rounded front lobe white, with purple crests on the fleshy disk, and dotted with lilac; spur short, conical; racemes short, erect, many-flowered. Summer. *l.* lorate, obliquely and obtusely bilobed at apex, with an intermediate cusp. India. A beautiful little plant. See Fig. 150. SYNS. *V. testacea, Aërides testaceum, A. Wightianum* (B. M. 5138; F. d. S. 1452.)

V. Roxburghii (Roxburgh's).* *fl.*, sepals and petals pale green, with chequered lines of olive-brown, oblong-obovate, the outer surface white; lip violet-purple and convex in the front part, deeper purple towards the apex, the lateral lobes white, lanceolate; spur pinkish, short; racemes six to twelve-flowered, on erect peduncles. Summer. *l.* ligulate, recurved, channelled,

Vanda—*continued.*

coriaceous, obliquely three-toothed at apex. Stems erect, dwarfish, stout. Bengal, 1850. (B. M. 2245; B. R. 506; F. d. S. Feb. 1846, 641, f. 2; L. & P. F. G. ii. 42, f. 2; W. O. A. 59.) Of this species there are several varieties, one having a dark blue lip, and another, *V. tessellata* (P. M. B. vii. 265; I. H. n. s. 579, *V. R. rubra*) a pink lip.

V. Sanderiana (Sander's).* *fl.* flat, about 4in. across; dorsal sepal and the smaller petals pink, slightly stained with buff-yellow, the lateral sepals 2in. across, pale nankeen outside, within greenish-yellow, reticulated with dull crimson; lip small, concave, pale purplish-red at base, the tip chocolate-purple, strongly recurved, three prominent keels extending from base to apex; racemes axillary, many-flowered. September and October. *l.* broadly ligulate, coriaceous, recurved, 9in. to 12in. long, deeply channelled. Philippine Islands, 1881. (G. C. n. s., xx., pp. 440-1; I. H. ser. iii. 532; W. O. A. iii. 124.)

V. S. labello-viride (green-lipped). A distinct variety, having a green lip. Mindanad, 1886.

V. Stangeana (Stange's). *fl.* four or five in a raceme; sepals and petals internally at first greenish, afterwards ochre, tessellated with dark purple-brown; auricles of the lip blunt, white with yellow and some mauve-blue spots, the middle lobe white with mauve-blue or wholly mauve-blue, cordate-triangular. Assam, 1885. (R. X. O. ii. 102.)

V. suavis (sweet).* *fl.* large and handsome, freely produced, fragrant; sepals and petals pure white outside, spotted and barred with blood-purple within, the dorsal sepal and two petals sub-lobate; lip convex, three-lobed, the front lobe pale rosy-purple, narrow, deeply bifid, the lateral ones deeper rosy-purple, ovate, flat; racemes bold, elongated, on axillary peduncles. *l.* lorate, flaccid, recurved, dark green, obliquely toothed at apex. Java, 1847. A noble plant for exhibition purposes. (B. M. 5174; F. d. S. 641, f. 3, (*Hrubyana*) 1604-5; G. C. n. s. xxii., p. 237, Wingate's var.; L. & P. F. G. ii. 42, f. 3; R. X. O. i. 12; W. O. A. iv. 180.)

V. s. flava (yellow). *fl.* yellow, with broad, oblong, rich brown spots. (B. M. 4432, under name of *V. tricolor.*)

V. s. Gottschalckei (Gottschalcke's). *fl.* deliciously scented, larger and stouter than in the type; sepals and petals more densely spotted; lip bright rosy-purple, tipped with white; pedicels deeply tinged with rose. *l.* (and stem) stouter than in the type. 1869.

V. s. Lindeni (Linden's). *fl.*, sepals, petals, and base of lip white, spotted with purple, the rest of the lip purple. 1886.

V. teres (terete).* *fl.* large; sepals oblong, the dorsal one white, slightly tinged with rose, the lateral ones creamy-white, twisted, parallel with the lip; petals rose-magenta, lighter towards the margins, larger, sub-orbicular, undulated; lip bright rose-magenta, cucullate, large, strongly veined, the throat orange, striped and spotted with crimson, the apex dilated and emarginate; spur conical; racemes leaf-opposed, mostly two-flowered. June to August. *l.* (and stems) terete, dark green. Burmah, &c., 1828. A handsome, straggling or climbing species, several feet long. (B. M. 4114; B. R. 1809; P. M. B. v. 193; R. H. 1856, 22.)

V. t. Andersoni (Anderson's). *fl.* richer and deeper in colour, freely produced; racemes 10in. long, five or six-flowered. (W. S. O. ser. iii. 2.)

V. t. aurorea (rosy). *fl.*, sepals white; petals white, slightly rose-tinted; throat light ochre, with rosy lobes, which are furnished with two rows of small, purple dots; column light rose-purple. 1884.

V. t. candida (white). *fl.* white. A distinct and beautiful form.

V. teretifolia (terete-leaved). A synonym of *Sarcanthus teretifolius.*

V. tessellata (tessellated). A form of *V. Roxburghii.*

V. testacea (tile-coloured). A synonym of *V. parviflora.*

V. tricolor (three-coloured).* *fl.* white outside, handsome, fragrant; sepals and petals pale yellow spotted with brownish-red within, oblong-obovate, obtuse; lip three-lobed, the middle lobe rose-magenta, paler at the tip, convex, cuneate, deeply emarginate, the disk marked with five white lines, the basal lobes white, erect, rounded; spur white, short, compressed; column white, short, thick; racemes short, dense, on axillary peduncles. *l.* lorate, channelled, recurved, obliquely bilobed and somewhat erose at apex. Stems erect, tall. Java, 1846. (F. d. S. 641; L. J. F. 136; L. & P. F. G. ii. 42; W. O. A. ii. 77.) The following varieties of this superb species are enumerated by B. S. Williams, in the sixth edition of the "Orchid Grower's Manual": DALKEITH, a very highly-coloured form; DOWNSIDE, flowers large, and very rich in colour and markings.

V. t. Corningii (Corning's). *fl.*, sepals and petals rich yellow, spotted and streaked with deep crimson, margined on both surfaces with rosy-purple; lip dark plum-colour, softened off to pale rose towards the base. *l.* very broad, dark green, stout.

V. t. Dodgsoni (Dodgson's). *fl.* very highly scented, borne in great numbers on the racemes; sepals and petals light amber, streaked and blotched with reddish-brown, and margined with violet; lip rich violet-purple, with a few white blotches near the base.

Vanda—*continued.*

V. t. insignis (remarkable). *fl.*, sepals and petals light yellow, spotted with crimson; lip pale lilac. Generally spring and autumn. This handsome variety was formerly known in gardens as *V. insignis*.

V. t. Patersoni (Paterson's). *fl.* about 2in. in diameter, appearing on very small plants; sepals and petals creamy-white, densely spotted with cinnamon-brown, broad; lip bright magenta. (G. C. n. s., xxii., p. 236.)

V. t. planilabris (flat-lipped). *fl.* larger and brighter-coloured than in the type; sepals and petals citron-yellow, thickly spotted with rich brown, very broad, clawed or narrowed to the base; lip rose-coloured, margined with purplish-mauve, and striped with chocolate-purple on the disk, large and flat. (W. O. A. ii. 87.)

V. t. Russeliana (Russel's). *fl.* very bright-coloured, in long racemes. A beautiful variety, having a peculiar, pendulous style of growth; it is very robust.

V. t. Warneri (Warner's). *fl.*, sepals and petals distinctly margined with deep rose; lip deep rosy-purple. *l.* linear, lorate, peculiarly ribbed. (W. S. O. ser. ii. 39.)

V. undulata (waved). *fl.* white, very freely produced in racemes; sepals and petals lanceolate, much undulated; lip having the lateral lobes greenish, and marked with orange lines on the disk. *l.* coriaceous, ligulate, unequally bilobed. India, 1875. This has been sold under the name of *V. Goweræ*.

V. violacea (violet). A synonym of *Saccolabium violaceum*.

V. Vipani (Vipan's). *fl.*, sepals and petals blunt, rhomboid, white externally, within pale at the base, marked with short, brownish-purple lines, the rest of the sepals brownish-olive, and of the petals inclining to ochre, all striped with dark brown-purple; middle lobe of the lip olive-green, the side auricles yellow. *l.* very long and narrow. Burmah, 1882.

VANDELLIA (named in honour of Dominico Vandelli, Professor of Botany at Lisbon, who wrote a work on Portuguese plants in 1623). Including *Tittmannia* (of Reichenbach). ORD. *Scrophularineæ*. A genus embracing about thirty species of stove, greenhouse, or hardy, often annual, branched herbs, inhabiting warm regions. Flowers rather small, solitary in the axils, sessile or pedicellate, or in terminal recemes; calyx five-parted or five-toothed; corolla bilabiate, the upper lip emarginate or shortly bifid, the lower one large, three-lobed; stamens five, perfect. Leaves opposite, often toothed. The few species introduced are now probably lost to cultivation.

VANDESIA. A synonym of **Bomarea** (which *see*).

VANESSA. A genus of Butterflies, conspicuous by their size (varying from 2¼in. to 2¾in. in spread of wings), their bright colours, and the bold markings on the upper surface of the wings; the lower surface is dull-coloured for concealment. The front wings have a distinct tooth above the middle of the hind margin, and the inner margin is nearly straight. The hind wings usually have a short

FIG. 151. VANESSA IO.

tooth in the hind margin (see Fig. 151). In the middle of the hind wing is a space bounded on all sides by the wing veins; the sixth and seventh veins are not united, but arise directly from the vein bounding the space. The

Vanessa—*continued.*

antennæ have the terminal club rather long. The front legs are small and useless for walking. The larvæ are long and worm-like, but covered with stiff spines on all but the first ring. The pupæ are angular; they hang by the tip of the body, and frequently bear golden or silvery-metallic spots here and there, or over most of their surface. The Butterflies are single-brooded each year, except the Small Tortoiseshell, which has a succession of broods. Most of the species hybernate as Butterflies, appearing on warm days during winter. There are five British species of the genus, viz., *V. Antiopa* (Camberwell Beauty), *V. Atalanta* (Red Admiral), *V. Io* (Peacock, see Fig. 151), *V. polychloros* (Great Tortoiseshell), and *V. Urticæ* (Small Tortoiseshell). Of these *V. Antiopa* feeds on various Willows, and *V. polychloros* on Elm; but both are local or scarce in Britain. The other *Vanessæ* feed on Nettles. The Butterflies may be distinguished from one another by the colour of the upper surface of the wings.

V. Antiopa (rarely seen in England) has a span of about 3in. across the wings; the latter are purplish-brown, with broad, yellow or yellowish-white borders, margined on the inner side with a broad, black band, in which are six or seven blue spots.

V. Atalanta has the wings nearly black, with a broad, deep red band across the middle of the front wings, and round the hind margin of the hind wings; the band on the hind wings has four black spots in it. Each front wing bears six white spots near the tip, and there is a blue and black spot at the hind angle of each hind wing.

V. Io is of the size and form shown in Fig. 151; the ground-colour is dull red, the margins are brown, the eye-like spots on the wing are variously shaded with black, lilac, red, yellow, and white; those on the hind wings are bordered with grey-brown.

V. polychloros and *V. Urticæ* are very like one another, both having tawny-orange wings, with a dark border inclosing blue spots; and in both there are three large, black spots, separated by yellow spots, on the front border, and two small, black spots near the middle, of the front wings; and the basal part of the hind wings is dark. The two species differ as follows: *V. polychloros* is usually over, and *V. Urticæ* is under, 2¼in. in spread of wings. The latter species has a white spot on the front margin of the front wings, near the tip, where the former species has a yellow spot, and in *V. polychloros* there is a black spot more on the inner border of the front wings, and the blue spots in the dark borders of the front wings are faint or absent. *V. Urticæ* is one of the earliest of British Butterflies, and is conspicuous in almost all parts of the country.

Those species of *Vanessa* that feed on Nettles are beneficial; while the others are never numerous enough in Britain to call for a special remedy.

VANGUERIA (*Voa* - *Vanguer* is the Madagascar name of *V. edulis*). SYNS. *Meynia*, *Rytigynia*, *Vanguiera*, *Vavanga*. ORD. *Rubiaceæ*. A genus comprising about thirty species of stove shrubs and small trees, sometimes spiny, inhabiting tropical and sub-tropical regions (except in Australia). Flowers white or greenish, small, cymose or fascicled; calyx tube short, the limb five, rarely four, toothed or lobed, or irregularly five to ten-toothed; corolla tube short or mediocre, the limb of five, rarely four or six, ovate, acute, acuminate, or appendiculate, at length reflexed lobes; stamens five. Fruit a dry or fleshy drupe, sometimes edible and rather large. Leaves opposite, coriaceous or membranous; stipules interpetiolar, frequently connate in a persistent ring. *V. edulis* and *V. velutina* are the only species calling for description in this work. They thrive in a compost of loam and peat. Propagation may be effected by cuttings, inserted in similar soil, under a glass, in heat.

Vangueria—*continued.*

V. edulis (edible-fruited). *fl.* green; cymes springing from below the leaves. June. *fr.* resembling an apple, but not crowned, succulent, edible, containing five stones. *l.* ovate, membranous, glabrous. *h.* 12ft. Madagascar, 1809. A small, unarmed tree.

V. velutina (velvety). *fl.* pale yellowish-green, axillary in the lower leaves, in short, dense cymes. May. *l.* large, opposite, nerved, shortly petiolate, cordate-ovate, rather acute, entire, much waved, mostly downy beneath. *h.* 3ft. Madagascar, 1829. A softly-tomentose shrub. (B. M. 3014.)

VANGUIERA. A synonym of **Vangueria** (which *see*).

VANHOUTTEA. A synonym of **Houttea** (which *see*).

VANILLA (from the Spanish *vainilla*, a little sheath; in allusion to the shape of the fruit). SYN. *Myrobroma.* ORD. *Orchideæ.* A genus embracing about a score species of stove, tall-climbing, branched Orchids, scattered over tropical regions. Flowers large, but usually dull-coloured and uninteresting, in axillary, often short racemes or spikes; sepals and petals sub-equal, free, spreading; claw of the lip adnate with the elongated, wingless column, the limb broad, concave, its base rolled around the column; bracts ovate. Capsule often elongated, fleshy, not (or at length scarcely) dehiscent. Leaves coriaceous or fleshy, nerved, sessile or shortly petiolate. *Vanilla* is remarkable in being the only genus of the order which possesses any economic value. The fruit of several species is largely employed, under its botanical name, for flavouring chocolate, liqueurs, ices, &c. *V. planifolia* produces the best Vanilla. Only four species call for description in this work. They should be potted or planted out in a narrow bed, in peat and sphagnum, and trained up a wall or on a thick piece of wood. A strong heat is favourable to their well-being. Propagation may be effected by cuttings; the climbing stems produce roots, and may be cut into lengths for the purpose.

V. bicolor (two-coloured). *fl.* very fragrant, 3in. long; sepals and petals dull red, acute, spreading; lip cream-coloured, half-free, convolute, apiculate, undulated; column bearded. *l.* ovate-oblong, sub-sessile, acute, striated, reddish on the margins. Demerara.

V. lutescens (yellowish). *fl.* 6in. across, showy, two or more together from the axils of the leaves, somewhat resembling in general appearance those of *Cattleya citrina;* sepals and petals greenish-yellow; lip very bright yellow. La Guayra, 1859. (F. d. S. 2218.)

V. Phalænopsis (Phalænopsis-like). *fl.* 3in. across, six or seven in an umbel; sepals faint blush-white, keeled behind, acute, the two lateral ones divided to the base on the lower side; petals the same colour, but less acute, channelled; lip pale rosy-blush outside, tawny-orange within, over 1in. long, broadly funnel-shaped. Stems long, rooting, leafless. Madagascar, 1869. An interesting species. (F. d. S. 1769.)

V. planifolia (flat-leaved). *fl.* wholly green, or white within, or with a white lip, 2in. across; sepals and petals lanceolate-oblong; lip callous below the serrulated, repand summit, and crested at the middle with minute, recurved scales. *fr.* 6in. long, sub-cylindrical. *l.* fleshy, 5in. to 7in. long, oblong or ovate-oblong, acute, contracted at base. Stem cylindrical. West Indies, 1800. (A. B. R. 538; B. M. Pl. 272; L. B. C. 733.)

VANILLA PLANT. *See* **Trilisa odoratissima.**

VAPOUR. Moisture which, in heated plant-structures especially, arises from the soil, walls, paths, &c., when watered, and from evaporating troughs filled with water and placed on the hot-water pipes. Vapour in an invisible state is continually ascending from damp, heated substances; hence the feeling of moisture in the air of the interior of plant-houses, &c., and sometimes outside after rain.

VAPOURER MOTH. *See* **Orgyia antiqua.**

VARGASIA. A synonym of **Thouinia** (which *see*).

VARIEGATED. Irregularly coloured.

VARIETY. A sort or modification subordinate to a species. A Variety can only be propagated with certainty by grafts, cuttings, bulbs, tubers, or any other method which produces a new plant by the development of one or more buds taken from the old one. If the Variety generally comes true from seed, it is often called a Race.

VARIOLATE. Marked as if by the pustules or pittings of small-pox.

VARNISH-TREE. A common name for *Ailantus glandulosus, Melanorrhœa usitatissima, Rhus vernicifera,* &c.

VARRONIA. A synonym of **Cordia** (which *see*).

VASCOA. Included under *Rafnia.*

VASCONCELLEA. Included under *Carica.*

VASCULAR. Furnished with, or relating to, vessels or ducts.

VASCULAR SYSTEM. Under this name are included all those parts of plants in which true **Vessels** (which *see*) occur. As the latter are found only in flowering plants, and in Vascular Cryptogams (Ferns, Horsetails, Club-mosses, and their allies), there is no Vascular System in the remaining groups of Cryptogams, *i.e.*, in the True Mosses, Liverworts, Algæ, Lichens, and Fungi. It is often represented, or rather foreshadowed, among the Mosses and some of the species in the other groups, by bundles or strings of long, tapering cells, which, to some extent, do the same work. The Vascular System is present in the roots, stems, branches, and leaves of the Vascular Plants. It remains when continued steeping in water, or exposure to the weather, has caused the decay of all the softer cells in these plants, so that it forms the skeleton or framework on which the plants are built up. It is best seen in those parts in which the bundles or strings of which it consists are always separated by cellular tissue from one another, *e.g.*, in leaves, and in the stems of Monocotyledons and Ferns, and in young stems of herbaceous Dicotyledons. In the stems and roots of woody Dicotyledons it becomes more difficult to recognise the true nature of the Vascular System, owing to the formation of annual rings of wood and of bast by the cambium layer just below the bark.

The chief uses of the Vascular System are twofold, viz.: (1) It gives strength and mechanical support to all parts of the plant, serving as the framework for the cellular tissues, in which the work of preparing the food goes on; (2) the wood, in the Vascular System, is the channel of communication for conveying the crude sap upwards from the soil to the leaves, and the soft bast in each bundle is believed to be the chief channel by which the protoplasmic food-substances are conveyed from the leaves, in which they are prepared, to the growing points, where they are used up in forming new structures, or to the parts (tubers, seeds, &c.) where they are stored up for future use. *See* **Sap.**

VASCULUM. A botanist's collecting-box. The term is also applied to a pitcher-shaped leaf.

VASES. There are various kinds of Vases in use, both for growing plants in, and also for arranging cut flowers. Vases for terrace walls and other positions in formal flower-gardening, and also for conservatory embellishment, are made in various sizes, and in great variety of design. Terra-cotta is largely employed in their manufacture, as it withstands all weathers, and is well adapted for the purpose. Vases are also made of stone and cast iron, amongst other substances. For the arrangement of cut flowers for table and room decorations, glass Vases are best — flowers do not look so well in anything else—but sometimes silver, old china, or other valuables, are used for the purpose of exhibiting them, in addition to making them receptacles for flowers. China and glass

Vases—*continued.*

Vases may be procured in the greatest range of variety, and in shapes and sizes which suit all individual requirements. It is unnecessary to describe the various kinds, but those known as Trumpet Vases or Glasses are amongst the best for cut flowers. In dinner-table decoration the Vases should be low in stature, or, if one or more Trumpet Glasses are used down the centre, so lightly arranged with flowers that nothing shall be caused in the way of an obstruction to the view from one side of the table to the other.

VAUANTHES. A synonym of **Grammanthes** (which *see*).

VAVANGA. A synonym of **Vangueria** (which *see*).

VEGETABLE BUTTER. *See* **Bassia butyracea.**

VEGETABLE EARTH, or **VEGETABLE MOULD.** Soil largely mixed with humus or decayed remains of plants (*see* **Humus**). It is usually very dark, but the colour varies with the proportion of humus, and of the other constituents of the soil. Good Vegetable Mould may contain from 3 to 25 per cent. of humus, and is usually very fertile. A higher percentage of plant-remains is unfavourable, as organic acids are apt to be formed and to accumulate in the soil, to the detriment of most plants, though some species of wild plants prefer such a soil, *e.g.*, several prefer peat, which consists of little but humus. To render such soils as contain excess of humus fertile, it is necessary to add certain manures or other substances to them in order to hasten the decay of the vegetable remains, and to bring them into a condition fit for the nutrition of the plants for which the ground is to be prepared. *See also* **Humus.**

VEGETABLE FIRE-CRACKER. A common name for **Brodiæa coccinea** (which *see*).

VEGETABLE HAIR. A common name for **Tillandsia usneoides** (which *see*).

VEGETABLE HORSEHAIR. The fibre of *Chamærops humilis.*

VEGETABLE IVORY. The nuts of *Phytelephas macrocarpa.*

FIG. 152. FRUITS OF VEGETABLE MARROW.

VEGETABLE MARROW (*Cucurbita Pepo ovifera*). A half-hardy, trailing annual, of very easy culture, grown

Vegetable Marrow—*continued.*

in nearly every garden during summer for the fruits, which are chiefly used when about half-grown, or even in a younger state (see Fig. 152), for cooking in various ways. At these stages the flesh is exceedingly tender, but as the fruits get old it becomes drier. Cultivators sometimes allow a portion of their crop to ripen, for the purpose of converting the fleshy portion into jam, or the fruits may be kept in a dry place when ripe until midwinter for cooking. Seeds of Vegetable Marrows should be sown singly, or two in a 3in. pot, towards the end of April, and placed in a gentle heat. So soon as the plants have two rough leaves, they should be hardened by being placed in a situation where air can be admitted. Early in June, they may be planted out where they are intended to remain, and covered for a few days with hand-glasses until re-established, when the glasses may be removed. Old manure heaps are the best positions for the plants, as on these they grow and fruit abundantly. Plenty of water should be supplied throughout the summer whenever the weather is dry, and the fruit should be cut when large enough for cooking, unless required for ripening to produce seed or for using in one of the ways above mentioned. The growths need an occasional thinning during summer when they get too much crowded.

SORTS. The following are amongst the best sorts of cultivated Vegetable Marrows:

BUSH MARROW, of compact, bushy habit, not a trailer; free. CUSTARD, free-bearing and of good flavour. HIBBERD'S PROLIFIC, fruit small, egg-shaped. LONG WHITE, fine cropper; the best for general use, and when only one variety is grown. MOORE'S VEGETABLE CREAM, free-bearing, and of fine flavour. MUIR'S PROLIFIC HYBRID, an oval-shaped, cream-coloured variety: prolific. PEN-Y-BYD, fruit delicate creamy-white, nearly globular, with firm flesh; plant short-jointed and prolific; very distinct.

VEGETABLE OYSTER. *See* **Tragopogon porrifolius.**

VEGETABLE REFUSE. After being made up into a compost, and allowed to ferment for some time, Vegetable Refuse of all kinds can be most advantageously employed as manure. This treatment is especially advisable when the Refuse contains a fair proportion of woody substance, as the latter can scarcely serve as manure for plants until it has undergone chemical decomposition to some extent. When the proportion of woody substance is large, it is well to burn the Refuse slowly, in a covered heap, in which the fire is kept smouldering, but is never allowed to burst into flame. Other kinds of Refuse should be made up with layers of earth and quicklime. The latter destroys the weeds, and hastens their decay. Another good method of forming a compost is to mix the Refuse with earth, and occasionally drench the heap with liquid manure. This promotes the formation of Ammonia; and gypsum should be mixed with the earth to form Sulphate of Ammonium, which prevents the loss of the alkali, and adds much to the value of the compost. Quicklime must not be mixed with the earth, as it sets free Ammonia, which escapes as a gas into the atmosphere, and is lost. Both of these composts are excellent garden manures.

VEGETABLE SCULPTURE. *See* **Topiary Work.**

VEGETABLE TALLOW PLANT. A common name for **Stillingia sebifera** (which *see*).

VEINLET. One of the ultimate or smaller ramifications of a vein or rib.

VEINS. In general, any ramifications or threads of fibro-vascular tissue in a leaf or any flat organ (especially those which divide or branch) through which sap is carried into the parenchyma.

VEITCHIA (named in honour of the late James Veitch, of Chelsea, the leading nurseryman of his day). ORD. *Palmæ*. An imperfectly-known genus (four species have been indicated) of stove Palms, inhabiting the Fiji Islands and the New Hebrides. Male flowers much smaller than the females; spathes three (?), deciduous; spadix shortly and thickly pedunculate, the branches elongated, fastigiate, thickened at base. Fruit about 2ft. long, ellipsoid or fusiform-ovoid and slightly beaked, or sub-globose. Leaves terminal, equally pinnatisect; pinnæ linear or acuminate, unequally truncate, the margins thickened. Only two species are at present grown in gardens. For culture, *see* **Kentia.**

V. Canterburyana (Canterbury's). A synonym of *Hedyscepe Canterburyana*.

FIG. 153. VEITCHIA JOHANNIS.

V. Johannis (John Veitch's).* *fl.* minute; spadix much branched, the branches forming large bunches. *fr.* at first green, at length bright orange, red at base, ovoid-ellipsoid. *l.*, pinnæ minutely toothed, the midrib terminating in a small curve, the apex obliquely truncate. Fiji, 1868. "Seedlings have, from the first, a straight stem, their sheath, petiole, and rachis being of a dark blood-colour, and covered when young with a grey tomentum, which is interspersed with lancet-shaped, thin, dark red lepida" (Wendland, in Seemann's "Flora Vitiensis"). See Fig. 153. SYN. *Kentia Joannis*.

V. Storckii (Storck's). *fl.*, spadix resembling that of *Cocos nucifera*, much and repeatedly branched; principal branches triangular, the lower ones having as many as twelve branchlets. *fr.* ellipsoid, with a slender, blunt taper. *l.*, pinnæ coriaceous, glabrous on both sides, much folded towards the base, and furnished with three prominent, longitudinal ribs, the two lateral ones of which are close to the margins. Trunk hard and smooth, dark brown below, light brown above. *h.* 40ft. Fiji. SYNS. *Kentia elegans* (of gardens), *K. Storckii*.

VEITCHIA (of Lindley). Included under **Picea** (which *see*).

VELAGA. A synonym of **Pterospermum** (which *see*).

VELANI OAK. *See* **Quercus Ægilops.**

VELASQUEZIA. A synonym of **Triplaris** (which *see*).

VELEZIA (named in honour of Franc. Velez de Arciniega, a Spanish writer on medicinal botany). ORD. *Caryophylleæ*. A genus embracing four species of hardy, annual herbs, inhabiting the Mediterranean region and Western Asia. Flowers sub-sessile, solitary in the axils or clustered at the tips of the branchlets; calyx acutely five-toothed; petals five, inconspicuous. Leaves subulate. Two of the species have been introduced, but they possess no horticultural value.

VELLA (of uncertain derivation, said to be Latinised from *Veler*, a Celtic name for such a plant). ORD. *Cruciferæ*. A small genus (three species) of small, much-branched, greenhouse or half-hardy shrubs, natives of Spain. Flowers yellow, rather large, sub-spicate, the lower ones bracteate; sepals erect, equal at base. Leaves entire. *V. Pseudo-cytisus*, the only species calling for mention here, is sometimes grown as a greenhouse plant, but is sufficiently hardy to endure the winter if planted in a dry, warm, south border. It may be multiplied by young cuttings, inserted in sand, under a glass

V. Pseudo-cytisus (False Cytisus). Cress Rocket. *fl.*, petals yellow, with long, dark purple claws; pedicels very short. April and May. *l.* alternate, obovate, entire, rough with hairs. *h.* 2ft. to 3ft. 1759. (B. R. 293.)

VELLEIA (named after Major Velley, who was greatly interested in *Algæ*; he died in 1806). Including *Euthales*. ORD. *Goodenovieæ*. An Australian genus embracing eleven species of greenhouse, perennial herbs, having (except *V. macrophylla*) a short, thick stock and radical leaves. Flowers yellow, like those of *Goodenia*, but the calyx is free from the ovary; scapes (or peduncles in *V. macrophylla*) erect or ascending, di- or trichotomously branched, many-flowered; bracts opposite, free or connate. Four of the species are known to cultivation, and require similar treatment to that recommended for **Goodenia.**

V. lyrata (lyrate-leaved). *fl.*, sepals three; corolla about ½in. long, the lobes broadly winged; scapes 6in. to 12in. high, dichotomous, with spreading branches. April. *l.* oblong-spathulate, deeply toothed below the middle or lyrate-pinnatifid, often several inches long. 1819. (B. R. 551; H. E. F. 24.)

V. macrophylla (large-leaved). *fl.* in large, loose, dichotomous panicles; peduncles axillary. July. *l.*, cauline ones usually 2in. to 6in. long, toothed and narrowed into a rather long petiole. Stem erect, leafy, branching 3ft. to 4ft. high. 1839. Closely allied to the larger forms of *V. trinervis*. SYN. *Euthales macrophylla* (B. 209; B. R. 1841, 3.)

V. paradoxa (paradoxical). *fl.*, sepals five, free; corolla pubescent outside, sometimes spurred; scapes 6in. to 18in. high, di- or trichotomously branched. July. *l.* petiolate, from broadly ovate and under 2in., to narrow-oblong and above 4in. long, coarsely toothed or almost entire, sometimes quite entire. 1824. (B. R. 971.)

V. trinervis (three-nerved). *fl.*, calyx campanulate, with five unequal lobes; corolla five to six lines long, the lobes all broadly winged; scapes dichotomous, low and ascending or above 1ft. high. July. *l.* on long petioles, broadly or narrowly oblong, entire or remotely toothed. 1803. SYNS. *Goodenia tenella* (A. B. R. 446; B. M. 1137), *Euthales trinervis*.

VELLOZIA (called after a Portuguese naturalist named Velloz, who edited the works of Vandelli on Brazil).

Vellozia—*continued.*

SYN. *Xerophyta.* ORD. *Amaryllideæ.* A genus comprising about fifty species of stove and greenhouse plants, with fibrous, woody, erect, sometimes arborescent stems, natives of tropical and South Africa, Madagascar, and Brazil. Flowers white, sulphur-coloured, violet, orange-red, or blue, often showy; perianth campanulate or funnel-shaped, with scarcely any tube, the segments equal and erecto-patent, ovate, oblong, or long-acuminate at

Vellozia—*continued.*

base; stamens six, sometimes indefinite and collected in clusters; peduncles terminal, one-flowered. Leaves clustered at the tips of the branches, sometimes short, narrow, and straight, sometimes elongated, narrowly or broadly linear, rigid, often sharp. The best-known species are here described. They thrive in a compost of well-drained, sandy peat, and must not be over-watered. Propagation may be effected by seeds, or by suckers.

FIG. 154. VELLOZIA RETINERVIS.

Vellozia—*continued.*

V. candida (white). *fl.*, perianth pure white, very beautiful; stamens eighteen, in six bundles; peduncle elongated, above, as well as the ovary and perianth, scabrid-glandular. Summer. *l.* linear, grass-like, filiform-acuminate, rigidly keeled, remotely spinulose-serrated on the margins. Branches short, leafy at apex. Brazil, 1865. A very handsome, tufted, stove plant. (B. M. 5514.)

V. elegans (elegant). *fl.*, perianth pale lilac in bud, then pure white, 1¼in. across, the segments spreading; peduncle terminal, sheathed at base, divided into three to five slender pedicels 2in. to 6in. long. May. *l.* tristichous, recurved, 4in. to 8in. long, linear-lanceolate, acuminate, sharply keeled, serrated towards the apex. Stem rigid, flexuous, 6in. high. Natal, 1866. Greenhouse. (B. M. 5803.) SYN. *Talbotia elegans.*

V. retinervis (net-veined). *fl.*, perianth blue, 1½in. in diameter, the segments 1½in. to 1½in. long, three to four lines broad, naked outside; anthers ½in. long, nearly sessile; peduncles dark-coloured above, with a few bristles below the oblong ovary, which is densely clothed with ascending, brown bristles. *l.* long-linear, recurved, rigid, glabrous. Trunk 12ft. high, crowned with a tuft of leaves. Natal and Transvaal, 1877. Greenhouse. See Fig. 154. SYN. *Xerophyta retinervis* (G. C. n. s., vi., p. 837; R. G. 903).

V. squamata (scaly). *fl.*, perianth of a fine orange-red, the tube slightly enlarged upwards, the segments moderately spreading; scape longer than the leaves. Summer. *l.* terminal, 4in. to 6in. long, spreading, glaucous, linear, acuminate, keeled. Stem short, dichotomous, clothed with the scale-like remains of fallen leaves. Organ Mountains, 1841. Stove. SYN. *Barbacenia squamata* (B. M. 4136; P. M. B. xi. 75).

VELLOZIEÆ. A tribe of *Amaryllideæ*.

VELTHEIMIA (named in honour of Aug. Ferd., Count Veltheim, 1741-1801, a German supporter of botanical studies). ORD. *Liliaceæ*. A small genus (three species) of greenhouse or half-hardy, bulbous plants, confined to South Africa. Flowers showy, densely clustered in a terminal spike or raceme, shortly pedicellate or subsessile, pendulous or nodding; perianth tubular, cylindrical, equal or slightly enlarged above, persistent, the six lobes equal, very short, tooth-like; stamens six, equally affixed above the middle of the tube, included; scape simple, leafless; bracts scarious, short. Leaves radical, numerous, oblong or loriform, fleshy-herbaceous. The two species known to cultivation thrive in a light, loamy soil. Propagation may be readily effected by offsets; or leaves, pulled off close to the bulb, and inserted in pots of soil, will produce bulbs at their base.

V. glauca (glaucous). *fl.*, perianth red-spotted or yellowish, ½in. to ¾in. long; pedicels scarcely above one line long; raceme 2in. to 6in. long, 1½in. to 2in. thick; scape 1ft. or more high; bracts linear, three to four lines long. March. *l.* narrower than in *V. viridifolia*, glaucous, much undulated. 1781. (B. M. 1091.) A variety *rubescens* (reddish-flowered) is figured in B. M. 3456.

FIG. 155. VELTHEIMIA VIRIDIFOLIA, showing Habit and detached Raceme.

V. viridifolia (green-leaved). *fl.*, perianth reddish or yellowish, spotted, 1½in. to 1½in. long; pedicels two to three lines long; raceme 3in. to 4in. long, 3in. thick, forty to sixty-flowered; scapes 1ft. to 1½ft. long; bracts lanceolate, four to six lines long. August. *l.* ten to twelve, lorate, 8in. to 12in. long, 2½in. to 3in. broad, green, the margins undulated. 1768. See Fig. 155. (L. B. C. 1245.) SYN. *Aletris capensis* (B. M. 501).

Veltheimia—*continued.*

VELUTINOUS. Velvety; coated with soft, fine close, silky pubescence.

VELVET FLOWER. A common name for **Amaranthus caudatus** (which *see*).

VELVET LEAF. A common name for *Cissampelos Pareira* and *Lavatera arborea.*

VENANA. A synonym of **Brexia** (which *see*).

VENATION. The arrangement of veins.

VENEER GRAFTING. *See* **Grafting.**

VENIDIUM (no explanation of name given by its author). SYN. *Cleitria.* ORD. *Compositæ.* A genus comprising eighteen species of greenhouse or half-hardy, cano-tomentose or woolly, perennial herbs, confined to South Africa. Flower-heads rather large, on long peduncles; involucral bracts imbricated in many series; ray florets ligulate, entire or scarcely toothed. Leaves alternate, entire, sinuate-toothed, or pinnately dissected. For culture, *see* **Arctotis.**

FIG. 156. VENIDIUM CALENDULACEUM.

V. calendulaceum (Marigold-like). *fl.-heads* somewhat like those of the Pot Marigold; ray bright clear yellow; disk dark brown, nearly black. July to October. *l.* green, glabrous above, covered with a white-cottony felt beneath. *h.* 6in. to 12in. This is regarded, by Harvey and Sonder, as a variety of *V. decurrens.* See Fig. 156.

VENOSE. Veiny; having many branched veins.

VENTENATIA (of Smith). A synonym of **Stylidium** (which *see*).

VENTILAGO (from *ventilo*, to be exposed to the wind; alluding to the linear wings at the upper part of the fruit). ORD. *Rhamneæ.* A genus consisting of about ten species of stove, climbing shrubs, scattered over the tropics. Flowers small, in axillary and terminal (usually leafless) panicles, rarely in the axils; calyx with five spreading lobes; petals five, obtriangular or cucullate; stamens five. Leaves alternate, sub-bifarious. Only one species has been introduced. For culture, *see* **Berchemia.**

V. madraspatana (probably a native name). *fl.* green, in slender, simple or paniculate spikes. June. *l.* 2in. to 4in. long, oblong-lanceolate to ovate, acute or sub-acuminate, crenate or entire. Young branches (and leaves) glabrous or only slightly pubescent. India, 1822.

VENTILATION. Ventilation, or air-giving, is one of the most important operations in garden management, and the cultivation of all kinds of trees and plants under glass. Ventilators are requisite in all horticultural structures, for the purpose of regulating temperatures, and affording an interchange of air in their interiors. The amount of space made available for opening to admit air, depends on the kind of plants cultivated in any particular structure, as, for instance, conservatories and greenhouses. Peach houses and vineries need provision for the admission of an abundant circulation of air whenever it is required, or when circumstances and weather permit; while in plant stoves and houses in which the occupants need a more or less tropical atmosphere at all times, a smaller number of ventilators will suffice. It is always advisable to have some plan of giving Ventilation at, or near, the top: this is provided in most houses of modern construction, so that the least supply, or nearly the full amount, of air may be admitted without rain getting in, except from an occasional splashing. Ventilating gearing has been greatly improved during recent years, so that either top or bottom sashes along a house, say 30ft. long, may be easily opened or closed with one hand, working a lever, and the sashes may be fixed with the other hand to wherever they are required to remain. Where there are no side or front sashes, as in many lean-to houses, wooden door ventilators are best, fixed in the front wall; and if the air from these can be made to pass over the hot-water pipes, it will become warmed before reaching the plants. Wooden ventilators may be similarly placed in a back wall; but wherever convenient, lifting sashes are preferable.

There are numerous details attending the admission of air which depend on widely varied circumstances, and can only be learnt by practical experience; the state of the weather, which is often very changeable, and the difference between outside and inside temperatures, being, perhaps, the most important points to consider. At different seasons, too, the same plants will need very dissimilar treatment according to their stages of growth. During spring, the greatest care is necessary regarding the admission of air, as sudden changes of temperature, caused by improper Ventilation, quickly show their evil effects on young and tender foliage. In old-fashioned houses, with small panes of glass, the sun never has the same effect in raising the temperature inside, as in most of those of modern construction with large panes; hence the necessity of early attention to Ventilation becomes much greater with the last-named. Happily, many of the improved systems of applying air, as already referred to, afford the means of opening or closing the ventilators in a tenth part of the time occupied in handling each sash separately in a large house. In daily management, when it is known that air will have to be admitted to a house, the ventilators should be opened very gradually so soon as the temperature begins to rise in the morning or early part of the day. It is never good practice to allow the temperature to get high and then put on what air is required for the day at once, or even at twice. Under such management tender foliage often droops quickly because of a sudden change and excessive evaporation taking place. Few plants or trees are able to withstand this: their leaves often become scorched during the day, and the attacks of insects are much encouraged. In spring, the ventilating of forcing-houses and other structures may require somewhat different management nearly every day in order to keep near the requisite degree of heat. The quantity of air and the mode of applying it are, therefore, matters which must be determined in dealing with the culture of plants under such varied circumstances. What may be called general advice is to begin ventilating early, as already noted, when it is pretty certain that airing will be necessary,

Ventilation—*continued.*

and apply a little more at frequent intervals until sufficient for the day is put on. Secondly, draughts should always be avoided: if the air is cold or the wind rough, never open ventilators at the front and back parts of a house at the same time, unless the occupants are such as take no harm—and this is seldom the case. In summer, when the inside and outside temperatures are much more uniform than at other seasons, air may generally be most freely admitted without causing much injury.

VENTRAL. Belonging to the anterior or inner surface of a carpel; opposed to dorsal.

VENTRICOSE. Swelling unequally, or inflated on one side; *e.g.*, the corolla of many labiate and personate plants.

VENTRICULOSE. Abounding with veinlets.

VENUS' BASIN. An old name for *Dipsacus sylvestris.*

VENUS' FLY-TRAP. *See* **Dionæa muscipula.**

VENUS' GOLDEN APPLE. A common name for **Atalantia monophylla** (which *see*).

VENUS' HAIR. A common name for **Adiantum Capillus-Veneris** (which *see*).

VENUS' LOOKING-GLASS. A popular name for **Specularia Speculum** (which *see*).

VENUS' NAVELWORT. *See* **Omphalodes linifolia.**

VENUS' OR VENICE SUMACH. A common name for **Rhus Cotinus** (which *see*).

VEPRIS. Included under **Toddalia** (which *see*).

VERATAXUS. A synonym of **Taxus** (which *see*).

VERATRUM (the old Latin name, used by Lucretius and Pliny, from *vere*, truly, and *ater*, black; alluding to the colour of the root). False or White Hellebore. ORD. *Liliaceæ.* A genus embracing eight or nine species of hardy, perennial herbs, inhabiting Europe, Russian Asia, and North America. Flowers numerous in a terminal panicle, shortly pedicellate; perianth purplish, greenish, or whitish, persistent, broadly campanulate or explanate; segments (in hermaphrodite flowers) connate towards the base in a very short tube, in others oblong, spreading, subequal, scarcely contracted at base, many-nerved; stamens six. Leaves often broad, plicate-veined, contracted in an ample sheath, the upper ones rarely all narrow; floral ones bract-like. Stem erect, leafy. Rhizome thick (very poisonous), the root-fibres somewhat poisonous. The best-known species are here described. Gardeners make use of *V. album*, powdered, to destroy caterpillars. Veratrums thrive in any rich soil. Propagation may be effected by divisions, or by seeds.

V. album (white).* Langwort; Lyngwort. *fl.*, perianth whitish within, greenish outside at base, spreading, ¼in. to ½in. long, the segments crisped-denticulate; pedicels very short or almost wanting; racemes dense, the rachis pubescent; panicle 1ft. to 2ft. long. July. *l.* rather firm, plicate, puberulous beneath; radical ones oblong, 1ft. long, 5in. to 6in. broad. Stem puberulous, with ten to twelve leaves. *h.* 3ft. to 4ft. Europe and Siberia, 1548. (F. D. 1120; J. F. A. 335.) The following, formerly classed as species, are regarded, by Baker, as mere varieties:

V. a. Lobelianum (Lobel's). *fl.*, perianth wholly greenish, the segments narrower than in the type; lateral racemes dense, erecto-patent. 1818.

V. a. viride (green). *fl.*, perianth greenish, the segments lanceolate, acute; lower pedicels two to three lines long; lateral racemes loose-flowered, often reflexed. North America, 1742. SYN. *Helonias viridis* (B. M. 1096).

V. Maackii (Maack's). *fl.*, perianth dark-purple, ⅛in. to ¼in. long, the segments oblong, blackish at base; lower pedicels three to four lines long; lateral racemes ascending; panicle very loose, 6in. to 12in. long. Summer. *l.*, lower ones lanceolate, 6in. long,

Veratrum—*continued.*

1in. broad in the middle, distinctly petiolate; upper cauline ones sessile. Stem slender, 2ft. high, few-leaved, slightly thickened at base. Eastern Siberia, 1883. (R. G. 1070.)

FIG. 157. VERATRUM NIGRUM.

V. nigrum (black).* *fl.*, perianth blackish-purple, two to three lines long, the segments oblong, obtuse; lower pedicels one to three lines long; racemes dense-flowered, the lateral ones short; panicle narrow, 1ft. to 3ft. long. June. *l.*, lower ones oblong,

FIG. 158. PORTION OF INFLORESCENCE OF VERATRUM NIGRUM.

1ft. long, 6in. to 8in. broad, narrowed at base, plicate. Stem erect, 2ft. to 3ft. high, many-leaved, slightly bulbous at base. Central Europe, 1596. See Figs. 157 and 158. (B. M. 963; J. F. A. 336.)

VERBASCEÆ. A tribe of *Scrophularineæ.*

VERBASCUM (the old Latin name used by Pliny). Mullein. ORD. *Scrophularineæ.* A genus embracing nearly 100 species of mostly hardy, biennial herbs, rarely perennials or sub-shrubs, more or less tomentose or floccose-woolly, inhabiting Europe, North Africa, and West and Central Asia. Flowers yellow, fuscous, purple, or red, rarely white, on usually very short and ebracteolate pedicels, spicate or racemose; calyx deeply five-cleft or parted, rarely shortly five-toothed; corolla tube scarcely any, the lobes five, broad, nearly equal; stamens five, affixed at the base of the corolla. Leaves all alternate, often soft, entire,

Verbascum —*continued.*

FIG. 159. UPPER PORTION OF PLANT OF VERBASCUM PHŒNICEUM.

crenulate, sinuate-toothed, or pinnatifid. Few of the species are sufficiently beautiful to claim a place in our gardens. The British Flora embraces five species, *V. Blattaria*, *V. Lychnitis*, *V. nigrum*, *V. pulverulentum*, and *V. Thapsus*. A selection of the most desirable kinds is here given. With the exception of *V. nigrum* and *V. phœniceum* (both propagated by divisions), and of *V. pinnatifidum* (increased by cuttings), all are hardy biennials, and only require sowing in any ordinary soil.

V. bipinnatifidum (bipinnatifid). A synonym of *V. pinnatifidum.*

V. Blattaria (Blattaria). Moth Mullein. *fl.* bright yellow, rarely cream-coloured, ¾in. to 1¼in. in diameter; panicles slender, glandular; peduncles ¼in. to 1in. long. *l.*, radical ones 4in. to 10in. long, oblong-lanceolate, obtuse, crenate, lobulate, or sub-pinnatifid; cauline ones small, sessile, ovate or oblong, toothed or subcrenate. Stem 8in. to 4ft. high, simple or branched. Europe (Britain). (Sy. En. B. 942.)

V. Boerhaavii (Boerhaave's). Annual Mullein. *fl.* yellow, sessile, fascicled or rarely solitary; corolla ample; raceme simple or rarely slightly branched. *l.* crenate, woolly; lower ones petiolate, obovate or oblong; upper ones cordate-amplexicaul, rarely very shortly sub-decurrent, acute or long-acuminate. *h.* 2ft. South Europe, 1731. A pretty species.

Verbascum—*continued*

V. Chaixii (Chaix's).* Nettle-leaved Mullein. *fl.* yellow; calyx segments lanceolate, subulate; fascicles loosely many-flowered; raceme paniculate. *l.* green or tomentose beneath, crenate; lower ones petiolate, cuneate at base, truncate or incised; upper ones sessile, rounded at base. *h.* 3ft. South and Central Europe, 1831.

V. cupreum (coppery). A hybrid between *V. ovalifolium* and *V. phœniceum*.

V. ferrugineum (rusty). A synonym of *V. phœniceum*.

V. formosum (beautiful). A synonym of *V. ovalifolium*.

V. Myconi (Mycon's). A synonym of *Ramondia pyrenaica*.

V. nigrum (dark). Dark Mullein. *fl.* numerous within each bract, more or less stalked; corolla yellow, with bright purple hairs to the filaments. Summer and autumn. *l.* crenate, nearly glabrous on the upper side, slightly woolly beneath; lower ones large, cordate-oblong, on long stalks; upper ones nearly sessile, small, and pointed. Stem sparingly clothed with woolly hairs, 2ft. to 3ft. high, ending in a long, simply-branched raceme. Europe (Britain), Western Asia. A pretty perennial.

V. olympicum (Olympian).* *fl.* bright golden-yellow, 1in. to 1¼in. in diameter. *l.* rosulate, broad, lanceolate, acuminate, woolly. Stem 5ft. to 6ft. high, branched from near the base in a candelabra-like manner. Levant, 1883. Biennial. (R. G. 1078.)

V. ovalifolium (oval-leaved). *fl.* orange, large, solitary, disposed in a simple or dense spike; upper filaments orange- or purple-woolly. *l.* ovate; lower ones doubly or incised-crenate; upper ones cordate-amplexicaul. *h.* 1ft. Tauria, 1804. (B. M. 1037.) SYN. *V. formosum* (B. R. 558). *V. cupreum* (B. M. 1225) is a hybrid between this species and *V. phœniceum*.

V. phlomoides (Phlomis-like). Woolly Mullein. *fl.* yellow, fascicled; pedicels shorter than the calyx; racemes sub-solitary, elongated. *l.* crenulate, or the oblong radical ones doubly or sub-incised crenate; upper ones short, obtuse, or the intermediate ones somewhat angular-decurrent. *h.* 3ft. South Europe, 1739. (S. F. G. 221.)

V. phœniceum (violet).* *fl.* violet or red, rather large; pedicels solitary, remote, many times longer than the calyx; raceme glandular-pilose, simple or slightly branched. *l.* glabrous above, pubescent beneath; radical ones petiolate, ovate or oblong, entire or grossly crenate; cauline ones few, small. *h.* 3ft. South Europe, 1796. See Fig. 159. (B. M. 885; L. B. C. 637; R. G. 436, f. 2.) SYN. *V. ferrugineum* (A. B. R. 163). Perennial.

FIG. 160. PORTION OF INFLORESCENCE OF VERBASCUM THAPSUS.

V. pinnatifidum (pinnatifid). *fl.* yellow, in remote, few-flowered fascicles, sometimes sub-solitary; raceme slightly branched, rigid. *l.* mostly naked, green; radical ones bipinnatifid; cauline ones pinnatifid, with oblong, toothed segments; upper ones serrated or pinnatifid. Stems 1ft. or more high. Tauria, &c., 1813. Sub-shrub. (S. F. G. 228.) SYN. *V. bipinnatifidum* (B. M. 1777).

V. pyramidatum (pyramidal-flowered). *fl.* yellow; panicle pyramidal, canescent, 1ft. to 2ft. long, with short, bundle-flowered branchlets (or, in gardens, an often elongated raceme). *l.* doubly crenate; lower ones ample, long-narrowed to the base; upper ones sessile, cordate-auriculate. *h.* 3ft. or more. Caucasus, 1804. A pretty species. (S. B. F. G. 31.)

V. rubiginosum (reddish-brown). *fl.* yellow and red; pedicels bi- or ternate, rarely solitary, twice or many times as long as the calyx; raceme loose, branched, sub-paniculate. *l.* pubescent beneath, crenate; lower ones petiolate; upper ones sessile or cordate-amplexicaul. *h.* 2ft. Hungary, 1817.

V. r. tauricum (Taurian). *fl.* larger, on shorter pedicels; raceme simpler. (B. M. 3799, under name of *V. tauricum*.)

V. speciosum (showy). *fl.* yellow; pedicels longer than the calyx; fascicles loose, often many-flowered; panicles very long, branched. *l.* thick, entire, or the lower ones crenate, oblong, elongated, long-narrowed into the petioles; upper ones sessile or cordate-amplexicaul. *h.* 6ft. Hungary, 1818.

V. spectabile (remarkable). *fl.* yellow and purple; pedicels solitary or few together; raceme elongated, nearly simple, viscous-villous. *l.* doubly crenate, glabrous or pilose above, slightly tomentose beneath; lower ones petiolate, oblong-ovate, cordate at base; upper ones sessile, semi-amplexicaul. *h.* 2ft. Tauria, 1820.

V. Thapsus (Thapsus in Africa). Aaron's Rod; Adam's Flannel; Blanket Leaf; Cow's Lungwort; Hag or Hig Taper; Jacob's Staff; Shepherd's Club; Torches, &c. *fl.* yellow; corolla ⅔in. to 1in. in diameter, woolly outside; spike 6in. to 10in. long, dense, simple. *l.* very decurrent; radical ones 6in. to 8in. long, obovate-lanceolate, entire or crenate; cauline ones oblong, acute, the upper acuminate. Stem 2ft. to 3ft. high, stout. Europe (Britain). See Fig. 160. (F. D. 631; Sy. En. B. 937.)

VERBENA (the old Latin name used by Virgil and Pliny). Vervain. ORD. *Verbenaceæ*. A genus comprising about eighty species of greenhouse or hardy, annual or perennial herbs or sub-shrubs, almost wholly American. Flowers small or mediocre, solitary in the axils of the often narrow bracts; calyx tubular, five-ribbed, five-toothed; corolla tube straight or incurved, equal or slightly enlarged above; limb spreading, sub-bilabiate, the five lobes oblong or broad, obtuse or retuse; stamens four, didynamous, very rarely two, affixed above the middle of the tube, included; spikes terminal, rarely axillary. Leaves opposite, or rarely ternately whorled or alternate, toothed or often incised or dissected, rarely entire. *V. officinalis*, the British representative of the genus, was formerly held in great repute as a remedy for affections of the bladder, and its flowers were considered an instrument for restoring defective vision. Verbenas may readily be propagated by seeds, sown in heat, some time in early spring; or by cuttings of the young growths which have no flowers on them. The hardy species may also be increased by division of the rootstock. All require a rich soil, and may be planted in open borders during summer from the middle or end of May.

The best-known species are here described. Except where otherwise indicated, they are perennials, and flower in summer.

V. alata (winged). *fl.* rosy; spikes short, dense, sub-cylindric; panicle terminal, cymose, sub-fastigiate. *l.* sessile, ½in. to 1in. long, ovate or triangular-oblong, acute, entire or argutely serrated, three-nerved, wrinkled, strigose-scabrous. Stems sub-fastigiate. *h.* 4ft. Brazil, 1828. Half-hardy. (S. B. F. G. ser. ii. 41.)

V. amœna (pleasing). *fl.* pinkish-purple; corolla lobes bifid; spikes long, dense, erect. *l.* stipulate, pinnatifid; lobes oblong, acute, clothed with closely-pressed pubescence; stipules much more hairy than the blade. Stems partially recumbent, covered with stiff, whitish hairs. *h.* 1ft. Mexico. Half-hardy. (P. M. B. vii. 3.)

V. Aubletia (Aublet's). Rose Vervain. *fl.* reddish-purple or lilac, rarely white; corolla limb ½in. to ⅔in. broad; spikes pedunculate, elongated in fruit. *l.* 1in. to 2in. long, ovate or ovate-oblong, incisely lobed and toothed, often more deeply three-cleft, the truncate or broadly cuneate base tapering into a margined petiole. *h.* 1ft. or less. North America, 1774. Hardy. (B. M. 308; B. R. 294, var. 1925). *V. Lambertii* (B. M. 2200) is a form of this with narrower and more incised leaves. *V. L. rosea* (S. B. F. G. ser. ii. 363) has a light-coloured, fragrant corolla, ⅔in. wide.

V. bracteosa (conspicuous-bracted). *fl.* purplish or blue, very small, exceeded by some of the leafy bracts; spikes thick, terminal. *l.* cuneate-oblong or cuneate-obovate, mostly narrowed into a short-margined petiole, pinnately incised or three-cleft, and coarsely-toothed. North America, 1820. Plant diffuse or decumbent, hirsute, annual or becoming perennial at base. Hardy. (B. M. 2910.)

Verbena—*continued.*

V. chamædrifolia (Chamædrys-leaved). *fl.* of a splendid scarlet colour, large and showy; spike solitary, on an elongated, ascending peduncle. *l.* oblong or ovate, broadly cuneate at base, crenate or somewhat incised-serrated, strigose above, hairy beneath, on short petioles. Stems filiform, fork-branched, creeping. Brazil, 1827. Half-hardy under-shrub. (B. 129; B. M. 3333; S. B. F. G. ser. ii. 9.) SYN. *V. melissoides.*

V. c. Melindres (vernacular name). *l.* oblong or oblong-lanceolate, unequally incised-serrated and less hairy. (P. M. B. i. 173; B. R. 1184 and L. B. C. 1514, under name of *V. Melindres.*)

V. elegans (elegant). *fl.* blue; corolla limb large, with emarginate lobes; spikes terminal, pedunculate, pyramidal. *l.* shortly petiolate, pinnatifid-laciniate, cuneate at base, slightly strigose-hispid; segments entire, linear-oblong, the margins slightly revolute. Stems branched, procumbent. Mexico, 1826. Hardy annual.

V. erinoides (Erinus-like). *fl.* reddish-violet; corolla shortly exserted; spikes terminal, pedunculate, solitary, elongated, fastigiate, canescent-hairy. *l.* cuneate at base, decurrent, tripartite-pinnatifid or laciniate; laciniæ lanceolate, slightly acute, entire or somewhat toothed, the margins slightly revolute. Stems hairy, much-branched, decumbent, rooting; branches ascending. Peru, 1818. Hardy annual. SYN. *V. multifida.*

V. e. contracta (contracted). *l.* tripartite; laciniæ incised-pinnatifid; ultimate segments linear-oblong, acute. (B. R. 1766, under name of *V. multifida contracta*; S. B. F. G. ser. ii. 347, under name of *V. e. Sabini.*)

V. hastata (spear-shaped). Blue Vervain; Simpler's Joy; Wild Hyssop. *fl.* blue; spikes dense, strict, naked at base, or more or less pedunculate, numerous in a panicle. *l.* oblong-lanceolate, gradually acuminate, coarsely or incisely serrated, petiolate; some of the lower ones often hastately three-lobed at base. Stem erect, 3ft. to 6ft. high. North America, 1810. Hardy. *V. paniculata* (B. R. 1102) is a form wanting the three-lobed leaves.

FIG. 161. FLOWERING BRANCH OF VERBENA INCISA.

V. incisa (cut). *fl.* rosy-purple; calyx five lines long; spikes pedunculate, sub-ternate at the tips of the branches, corymbose-paniculate. *l.*, lower ones oblong-triangular, cuneate, truncate or sub-cordate at base, attenuated into the petioles, pinnatifid-lobed, deeply incised-serrated, wrinkled; upper ones nearly lanceolate, sessile, incised-pinnatifid. Stem ascending; branches erect. *h.* 2ft. Brazil, 1826. Greenhouse sub-shrub. See Fig. 161. (B. M. 3628.)

V. Lambertii (Lambert's). A form of *V. Aubletia.*

V. Melindres (vernacular name). A variety of *V. chamædrifolia.*

V. melissoides (Melissa-like). A synonym of *V. chamædrifolia.*

V. multifida (much-cleft). A synonym of *V. erinoides.*

V. mutabilis (changeable). A synonym of *Stachytarpheta mutabilis.*

Verbena—*continued.*

V. officinalis (officinal). Common Vervain; Holy Herb; Juno's Tears; Pigeon's Grass; Simpler's Joy. *fl.* lilac, ⅛in. in diameter; spikes dense-flowered, afterwards elongating. *l.* opposite, oblong, pinnatifid or tripartite, with acute or obtuse lobes; upper ones narrower. Stems 1ft. to 2ft. high, rigid, branched above. Europe (Britain). Plant hispid-pubescent. (F. D. 628; Sy. En. B. 1018.) SYN. *V. sororia* (S. B. F. G. 202).

V. paniculata (panicled). A form of *V. hastata.*

V. phlogiflora (flame-flowered). *fl.* purple or lilac (varying in cultivation to red and blue); corolla eight to nine lines long; spikes terminal, pedunculate, solitary or ternate, cymose-paniculate. *l.* oblong- or lanceolate-triangular, acute, cuneate at base, entire, long-attenuated into the petioles, incised-serrated, wrinkled, strigose above, hairy beneath, the margins slightly revolute. Stems ascending; branches erect. *h.* 1½ft. Brazil, 1834. Greenhouse sub-shrub.

V. p. vulgaris (common). *fl.* in solitary, terminal spikes. Stems slender, decumbent; branches much-spreading, diffuse, ascending-erect. (B. 60; B. M. 3541, P. M. B. iv. 5, and S. B. F. G. ii. 391, under name of *V. Tweediana.*)

V. pulchella (pretty). A synonym of *V. tenera.*

V. radicans (rooting). *fl.* lilac, fragrant; corolla twice as long as the pubescent calyx; spikes short, sub-capitate. *l.* trifid; segments mostly again trifid, the laciniæ oblong-linear, slightly fleshy, highly glabrous. Stems procumbent, rooting. Andes, 1832. Greenhouse sub-shrub.

V. rugosa (wrinkled). A synonym of *V. venosa.*

V. sororia (sisterly). A synonym of *V. officinalis.*

V. stricta (straight). *fl.* blue; corolla four to five lines long; spikes comparatively thick, dense, canescent, mostly sessile, or leafy-bracted at base. *l.* nearly sessile, ovate or oblong, very sharply and densely, mostly doubly serrated, rarely incised cinereous with dense, soft, hirsute-villous pubescence, rugose-veiny. *h.* 1ft. to 2ft. North America. Hardy. (B. M. 1976.)

V. sulphurea (sulphur-coloured). *fl.* pale sulphur-coloured; corolla limb rather large; spikes pedunculate, capitate, many-flowered. *l.* pinnatipartite or nearly so, petiolate, strigose-hispidulous on both sides; laciniæ much spreading, linear, obtuse, revolute. Stems procumbent; branches ascending or erect. *h.* about 2ft. Chili, 1832. Greenhouse, hairy sub-shrub. (B. R. 1748; S. B. F. G. ser. ii. 221.)

V. tenera (tender). *fl.* violet; corolla tube twice as long as the calyx; spikes terminal, pedunculate, solitary or ternate, fastigiate, at length elongated and relaxed, slightly canescent. *l.* decurrent in short petioles, laciniate-pinnatifid; segments linear, slightly acute, entire, the margins somewhat revolute. Branches ascending. Brazil, 1827. A much-branched, creeping, greenhouse sub-shrub. SYN. *V. pulchella* (S. B. F. G. 295).

V. t. Maonetti (Maonette). *fl.* of a pleasing reddish-violet; corolla segments white-margined. (B. H. 1870, 6; F. d. S. 1129; R. G. 142, f. 1.)

V. teucrioides (Teucrium-like). *fl.* white or pinkish; calyx ⅛in. long; corolla large, sweet-scented at night; spikes terminal, solitary, glandular-hairy. *l.* ovate or oblong-triangular, shortly cuneate at base, entire, shortly narrowed into the petioles, obtuse, somewhat sinuate-serrated, much wrinkled, the margins revolute, hairy above, tomentose beneath. Stems tufted, rooting at base, ascending, spreading-hairy. *h.* 2ft. Brazil, 1837. Greenhouse sub-shrub. (B. M. 3694; P. M. B. v. 243.)

V. trifida (trifid-leaved). *fl.* purple; spikes terminal, many, subsessile, short, very dense, clustered in a head. *l.* clustered, cuneate at base, sessile, ⅛in. to 1in. long, strigose-hispidulous, trifid or nearly so, emitting fasciculate-leafy branchlets from the axils; segments lanceolate, acuminate, the margins revolute. Branches tetragonal, and, as well as the spikes, hairy. *h.* 3ft. Mexico, 1818. A remarkable, greenhouse sub-shrub. (L. & P. F. G. i., p. 169.)

V. triphylla (three-leaved). A synonym of *Lippia citriodora.*

V. Tweediana (Tweedie's). A synonym of *V. phlogiflora vulgaris.*

V. venosa (conspicuous-veined).* *fl.* lilac or bluish; corolla tube slender, thrice as long as the calyx; terminal spikes sub-ternate, lateral ones pedunculate, fastigiate, at length cylindrical, imbricated. *l.* approximating, rigid, oblong, sub-cuneate, entire, semi-amplexicaul at base, adnate, acute, incised-serrated, spreading, unequal, the margins revolute, wrinkled and strigose above, hispidulous on the nerves beneath. Stems simple, ascending. *h.* 2ft Brazil, 1830. A beautiful and well-known, half-hardy plant, very useful for bedding, particularly if mixed with a silver-leaved Pelargonium. (B. M. 3127; S. B. F. G. ser. ii. 207.) SYN. *V. rugosa* (S. B. F. G. ser. ii. 318).

V. xutha (yellow). *fl.* purple or blue, more crowded in the strict spikes and larger than in *V. officinalis.* *l.* incisely pinnatifid or laciniate, or some of the lower ones tripartite, more or less canescent; lobes deeply toothed. *h.* 2ft. to 3ft. North America, 1824. Half-hardy.

Garden Varieties. Verbenas are amongst the most beautiful of summer bedding plants when they can be induced to succeed; but, unfortunately, of late years this

Verbena—*continued.*

has been an uncertainty, because of the plants being subject to, apparently, some kind of disease. For this reason, and also because stock plants are not, as a rule, easily preserved through the winter, many cultivators have taken to the raising of seedlings each spring for growing only through one summer. This is easily done, as the young plants grow rapidly and flower freely if the seed has been saved from a good source. Green Fly and Mildew are the greatest enemies to which the plants are subject; either of these, if allowed to remain on them, will soon work irreparable mischief. For exhibition purposes, Verbenas may be grown in pots in a cold frame. The following is a list of varieties that are best suited for bedding:

BOULE DE NEIGE, white, nicely scented. CRIMSON KING, crimson, with white eye; fine bedder. LADY LONDESBOROUGH, mauve, with white stripe. LUSTROUS, intense scarlet, with large, pure white eye; strong grower. NEMESIS, very deep pink. PURPLE KING, purple self; a good, well-known, old variety.

VERBENACEÆ. A natural order of herbs, shrubs, or trees, broadly dispersed over the warmer parts of the globe, and particularly abundant in South temperate regions. Flowers hermaphrodite or rarely, by abortion, polygamous, variously disposed; calyx inferior, persistent, the tube campanulate, tubular, or rarely almost obsolete, the teeth, lobes, or segments five, four, or rarely six to eight, or obsolete; corolla gamopetalous, the tube often incurved, the limb four or five-cleft, rarely multifid, the lobes equal or more or less bilabiate; perfect stamens four, didynamous, or two, or in a few genera as many as the corolla lobes; filaments inappendiculate; anthers two-celled; bracts variable, often small. Fruit more or less drupaceous or sub-capsular. Leaves generally opposite or whorled, entire, toothed, or incised-multifid, in one genus pinnate, in another digitately compound; stipules absent. Teak, one of the most important timbers in the world, is the wood of *Tectona grandis*. *Lippia citriodora*, and several species of *Lantana*, are used as tea. The order embraces fifty-nine genera, and nearly 700 species. Well-known examples are: *Clerodendron*, *Lantana*, *Verbena*, and *Vitex*.

VERBENA, LEMON-SCENTED. A common name for **Lippia citriodora** (which *see*).

VERBENA OIL-PLANT. A name given to **Andropogon Schœnanthus** (which *see*).

VERBENA, SAND. A common name for **Abronia** (which *see*).

VERBENA, SWEET-SCENTED. *See* **Aloysia.**

VERBESINA (altered from *Verbena*, which some of the species are supposed to resemble). Crown Beard. Including *Platypteris* and *Ximenesia*. ORD. *Compositæ*. A genus comprising about fifty species of stove, greenhouse, or hardy, annual or perennial herbs, sub-shrubs, or rarely shrubs, inhabiting the warmer parts of America. Flower-heads yellow, or the ray florets white; involucral bracts oblong or linear, in few series; receptacle convex or conical, paleaceous; ray florets ligulate, spreading,

FIG. 162. VERBESINA PINNATIFIDA.

entire or two or three-toothed; achenes glabrous or pilose. Leaves opposite or the upper ones (or all) alternate, petiolate, sessile, or decurrent, toothed, lobed, or rarely entire. Few of the species possess any horticultural value. Those described below are, with the exception of *V. encelioides*, perennials. All thrive in rich soil, and may be increased by seeds, the perennials also by divisions.

V. alata (winged). *fl.-heads* sub-globose, solitary, terminal; ray florets orange-yellow, numerous, sub-biseriate. August. *l.* alternate, long-decurrent, oblong or obovate, obtuse, undulated and sinuate-toothed, nearly glabrous. Stem winged. *h.* 2ft. West Indies, &c., 1699. Stove. (B. M. 1716.)

V. crocata (yellow). *fl.-heads* orange-yellow, solitary, globose. Summer. *l.* opposite, decurrent, irregularly pinnately lobed;

Verbesina—*continued.*

lobes oval, erose-dentate, the terminal one somewhat deltoid. Branches four-winged. *h.* 2ft. Mexico, 1812. Stove. SYNS. *Platypteris crocata, Spilanthes crocata* (B. M. 1627).

V. encelioides (Encelia-like). *fl.-heads* yellow, disposed in a somewhat corymbose manner; achenes of the rays wingless, three-toothed, those of the disk winged, two-awned. August. *l.* ovate or oblong, coarsely serrated; petioles broadly winged, auricled at base. Stem erect, 2ft. to 3ft. high. Mexico, 1785. A canescent, greenhouse annual. SYN. *Ximenesia encelioides.*

V. pinnatifida (pinnatifid-leaved). *fl.-heads* pale yellow; involucral scales blackish, linear-lanceolate, acute; rays about twelve, oblong; panicles opposite, branched, corymbose at apex. August. *l.* opposite, long-decurrent, pinnatifid, long-cuneate at base, hairy-puberulous on both sides, especially on the nerves. Stem four-winged, tomentose. *h.* 3ft. Mexico, 1826. Greenhouse. See Fig. 162.

V. sativa (cultivated). A synonym of *Vesligia sativa.*

V. virginica (Virginian). *fl.-heads* white, in compound corymbs; ray florets three or four, oval. August. *l.* alternate, ovate-lanceolate, feather-veined, toothed or lobed, decurrent, below, as well as the narrowly or interruptedly-winged stem, downy-pubescent. *h.* 2ft. North America, 1812. Hardy.

VEREIA. A synonym of **Kalanchoe** (which *see*).

VERGE-CUTTER. Another name for an edging-iron, a tool which is employed for cutting grass verges by the side of walks, flower-beds, &c., also for cutting out new beds in turf. The simple form with crescent-

FIG. 163. VERGE-CUTTER.

shaped blade (see Fig. 163) is the best, as it may be guided by the hand to cut in whatever direction is desired. It is unnecessary, as a rule, to use a Verge-cutter for the edges of walks more than once a year—spring is the best season—the shears being sufficient for the rest of the year. By the continued use of an edging-iron on both sides of a walk, the latter very soon becomes considerably widened.

VERMICULAR. Worm-shaped.

VERMIFUGA. A synonym of **Flaveria** (which *see*).

VERNAL. Appearing in spring.

VERNAL GRASS. The common name for **Anthoxanthum odoratum** (which *see*).

VERNATION. The disposition of the leaves within a leaf-bud.

VERNICOSE. Covered with natural varnish; appearing as if varnished.

VERNONIA (named in honour of William Vernon, a botanical traveller in North America). Ironweed. Including *Ascaricida* and *Webbia.* ORD. *Compositæ.* A vast genus (about 380 species) of stove, greenhouse, or hardy, annual or perennial herbs or shrubs, broadly distributed, chiefly

Vernonia—*continued.*

in the tropics, but most copiously in the warmer parts of America. Flower-heads purple, reddish, bluish, or rarely white, terminal, solitary, cymose, or paniculate, homogamous; involucral bracts in many series, the inner longest; receptacle naked or pitted, sometimes shortly hairy; florets all equal, tubular, slender, narrowly five-cleft; achenes striated, ribbed, or angled, rarely terete; pappus of many hairs, often girt with a row of outer short hairs or flattened bristles. Leaves alternate (or in one Brazilian species opposite), entire or toothed, penni-veined, sessile or petiolate. Few of the species are known to cultivation, the majority being mere weeds. Those described below thrive in rich, light soil, and may be readily increased by seeds, cuttings, or divisions, according to the nature of the plant.

V. acutifolia (acute-leaved). *fl.-heads* pale purple, sub-sessile at the sides of the branches; involucre hemispherical; florets forty. December. *l.* sessile, linear, acuminate, reticulate-nerved, slightly serrated, glabrous above, obscurely pilose beneath. Stem erect, terete. *h.* 4ft. South America. Greenhouse perennial. (B. M. 3062.)

V. axilliflora (axillary-flowered). *fl.-heads* violet-purple, sessile, much shorter than the floral leaves; cymes long, scorpioid, terminal. September. *l.* shortly petiolate, oblong-elliptic, acute at both ends, nearly entire, scabrous and pilose above, villous-tomentose beneath. Branches terete, villous. *h.* 1½ft. Brazil. Stove shrub. (L. B. C. 1690.)

V. Calvoana (Calvo's). *fl.-heads* white, 2in. broad, with a purple eye; involucral scales large and spreading, in many series; corymbs large, branching and spreading, bearing leafy, toothed bracts. January. *l.* sessile, oblong-lanceolate, acuminate, 8in. to 14in. long, toothed, much narrowed and unequally auricled at base. Stem stout, sulcate, branched, tomentose-pubescent. *h.* 8ft. to 12ft. Cameroons, 1861. A magnificent, stove shrub. (B. M. 5698.)

V. centriflora (centre-flowered). A synonym of *V. scorpioides.*

V. flexuosa (flexuous). *fl.-heads* purple or white; involucre campanulate, the bracts mucronate-acuminate; cymes scorpioid. September. *l.* sessile, oblong or linear-lanceolate, nearly entire, scabrous-pilose on both sides. Stem herbaceous, from a tuberous rhizome. *h.* 1½ft. Brazil, 1823. Stove. (B. M. 2477; L. B. C. 1880.)

V. noveboracensis (New York). *fl.-heads* purple; involucral scales tipped with a long, bristle or awl-shaped, spreading appendage, in some varieties merely pointed. August. *l.* lanceolate or oblong. *h.* 5ft. North America, 1710. Hardy perennial.

V. odoratissima (highly odorous). *fl.-heads* purple; involucral scales acuminate; cymes disposed in a panicle. October. *l.* shortly petiolate, rigid, obovate, cuneate at base, slightly toothed at apex, scabrid above, reticulated and hirsute-pubescent beneath. Stem terete, shrubby. *h.* 4ft. Caraccas, 1817. Stove.

V. pinifolia (Pine-leaved). *fl.-heads* bright purple; involucral scales mucronate, canescent; corymbs 3in. to 8in. across, mostly compound, of many heads, flat-topped. Summer. *l.* sessile, crowded, linear, acute, 1in. to 4in. long, half to four lines wide, becoming glabrous above, the margins revolute. Stems 1ft. to 2ft. high, mostly closely leafy throughout. South Africa, 1863. Greenhouse perennial. SYN. *Webbia pinifolia* (B. M. 5412).

V. scorpioides (scorpioid-cymed). *fl.-heads* lilac-rose, sessile, contiguous; involucral scales hairy, the inner ones acuminate, the outer ovate; cymes scorpioid, recurved, leafless, approximate. Summer. *l.* petiolate, elliptic, acute, pubescent beneath. *h.* 1ft. Brazil and West Indies, 1874. Stove shrub. (R. H. 1874, 231.) SYN. *V. centriflora.*

V. sericea (silky). *fl.-heads* purple or white, sessile, solitary or twin in the axils; involucre campanulate, the outer scales recurved, mucronate, the inner ones obtuse. December. *l.* very shortly petiolate, lanceolate, acuminate, sub-obtuse at base, sub-entire, nearly glabrous above, adpressedly pubescent beneath. Stem terete, striated, very slightly puberulous. *h.* 4ft. Brazil, 1823. Stove sub-shrub. (B. R. 522.)

VERONICA (a mediæval name of doubtful derivation, probably from *hiera eicon*, sacred image; in allusion to the legend of the sacred handkerchief of S. Veronica). Cancerwort; Speedwell. Including *Diplophyllum* and *Leptandra.* ORD. *Scrophularineæ.* A genus comprising about 160 species of greenhouse or hardy herbs, shrubs, or rarely trees, broadly dispersed over temperate and frigid regions. Flowers often varying in colour in the same species, blue, purple, flesh-coloured, or white, disposed in bracteate, terminal or axillary racemes, rarely solitary in the axils of alternate leaves; calyx four, five, or very rarely three-parted, the segments scarcely imbricated; corolla tube rarely exceeding the calyx; limb spreading,

Veronica—*continued.*

four or five-cleft, the lateral lobes exterior (or one exterior), the upper and lower ones usually narrowest; stamens two, exserted; pedicels ebracteolate. Leaves opposite, rarely whorled or somewhat scattered, the cauline ones very rarely alternate; floral ones always alternate, similar to the cauline ones or often reduced to bracts. Sixteen species are indigenous in Britain; among them the following may be mentioned: *V. Beccabunga* (Brooklime), with rather fleshy, blunt leaves, which are considered to be anti-scorbutic; *V. Chamædrys*, one of the loveliest of our wild flowers; and *V. spicata*, often grown in gardens. The best-known cultivated species are here described. Except where otherwise stated, they are hardy, and of perennial duration, thriving in any fairly good soil, and being increased by divisions. The shrubby kinds may be readily multiplied by cuttings, and the annuals by seeds.

V. alpina (alpine). *fl.* blue or violet; corolla two to three lines across; raceme spiciform or somewhat capitate, dense, or interrupted below. May. *l.* mostly shorter than the internodes of the simple stem (¼in. to 1in. long), ovate to oblong, crenulate-serrate or entire. *h.* 9in. to 12in. Europe (Britain), Asia, North America. (F. D. 16; Sy. En. B. 980.)

V. a. Wormskioldii (Wormskiold's). A villous-pubescent form, with larger leaves. 1819. (B. M. 2975.)

V. amethystina (amethystine-blue). A synonym of *V. paniculata.*

V. amplexicaulis (stem-clasping). *fl.* in short, conical, dense spikes ⅔in. to 1in. long, on hairy peduncles 1in. to 1½in. long, crowded together near the ends of the branchlets; corolla white, the tube ¼in. long, the limb ¼in. across. *l.* loosely imbricated, amplexicaul or sub-amplexicaul, oblong, obtuse, ⅓in. long, ⅛in. broad, glaucous, coriaceous, entire, slightly concave. *h.* 1ft. to 2ft. New Zealand. Decumbent or sub-erect shrub.

V. Andersonii (Anderson's).* *fl.* bluish-violet, sometimes whitish towards the base of the raceme; racemes shortly pedunculate, narrow-oblong, rather longer than the leaves. July. *l.* oblong, 3in. to 4in. long, somewhat obtuse, entire, puberulous on the margins, rather thick. *h.* 1½ft. Half-hardy shrub. Garden hybrid. (F. d. S. 658; L. J. F. 103; L. & P. F. G. 38.)

V. A. variegata (variegated). This differs from the type in having finely variegated leaves.

V. anomala (anomalous). *fl.* white, very shortly pedicellate or sessile; corolla tube ⅛in. long, the limb ⅛in. to ¼in. broad, the lobes nearly equal, three or two unequal, spreading, narrow; racemes crowded together, five to ten-flowered, sub-terminal. *l.* decussate, ⅛in. to 1in. long, ⅛in. to ¼in. wide, linear or linear-oblong, patent, often reddish-coloured, coriaceous, quite glabrous on the upper surface, sometimes ciliated on the margin, concave, entire, shortly petiolate. Branches long, slender, purplish or reddish towards the tips. *h.* 3ft. to 6ft. New Zealand. A dense-growing shrub.

V. Buxbaumii (Buxbaum's). *fl.* bright blue; corolla ¼in. across; peduncles solitary, axillary in alternate, leaf-like bracts. April to September. *l.* shortly petiolate, oblong or ovate-cordate, ¼in. to 1½in. long, coarsely serrated; floral ones similar, shorter than the decurved pedicels. Branches 6in. to 12in. long. Europe (naturalised in Britain). A prostrate annual. (F. D. 1982; Sy. En. B. 973.)

V. buxifolia (Box-leaved). *fl.* white; corolla tube short, the limb ⅛in. to ¼in. across; racemes very short, dense-flowered, crowded at the ends of the branches and sub-capitate, puberulous or glabrous; pedicels short; bracts as large as the sepals. *l.* ⅛in. to ½in. long, ⅛in. to ¼in. broad, broadly oblong-obovate, obtuse, suddenly truncate or cordate at the very short, thick petiole, excessively thick and coriaceous, concave. *h.* 2ft. to 3ft. New Zealand. A small, stout, glabrous shrub.

V. carnosula (slightly fleshy).* *fl.* white, with reddish-yellow anthers; corolla tube very short, the limb ⅛in. to ¼in. across; spikes short, pilose and pubescent, crowded and forming heads at the ends of the branches, very dense-flowered. Summer. *l.* closely imbricated, sub-erect, ⅛in. to ⅜in. long, broadly obovate or oblong or orbicular, round at tip, entire, very thick and coriaceous, almost sessile or on broad petioles. New Zealand. A stout, often prostrate shrub.

V. cataractæ (waterfall). *fl.* white or pinkish, ⅛in. to ⅜in. in diameter; pedicels very slender, ⅛in. to 1in. long; racemes axillary, slender, 3in. to 8in. long, very many flowered; bracts linear, subulate *l.* sessile or petiolate, ⅛in. to 5in. long, ovate-oblong or narrow-lanceolate, acuminate, deeply and acutely serrate, coriaceous. Stems sub-erect or prostrate at the base and ascending, 10in. to 2ft. long, branched, rather slender. New Zealand. Shrub.

V. caucasica (Caucasian). *fl.* pale red; pedicels filiform; racemes loose, many-flowered, on slender peduncles. June. *l.* sub-sessile, once or twice pinnatisect; segments oblong or linear-cuneate, narrowed at base, entire or incised. Stems ascending or erect, pilose. Caucasus, 1816. (L. B. C. 1369.)

V. Chamædrys (Chamædrys). Angels' Eyes; Birds' Eyes; Germander Speedwell; God's Eye. *fl.* bright blue; corolla ⅛in. to ¼in. across; raceme loose, 2in. to 5in. long, including the slender peduncle. May and June. *l.* all opposite, sub-sessile, ovate-cordate, ¼in. to 1½in. long, deeply serrated. Branches 8in. to 2ft. long, slender, ascending. Europe (Britain). Plant hairy. See Fig. 164. (F. D. 448; L. B. C. 53; Sy. En. B. 986.)

Veronica—*continued.*

FIG. 164. FLOWERING BRANCHLET OF VERONICA CHAMÆDRYS.

V. chathamica (Chatham Island). *fl.* dark purple, large, numerous, closely set; peduncles ⅛in. long, pubescent; racemes 1in. to 1½in. long, sub-terminal at the ends of the branches and axillary to the uppermost leaves. *l.* spreading, sessile, ⅛in. to 1½in. long, ⅛in. to ⅓in. broad, obovate-oblong or ovate-oblong, acuminate, entire, flat, scarcely coriaceous. Branches wiry, pubescent. Chatham Island. A small, prostrate, rambling shrub, adapted to the ornamentation of rockwork or earth-banks.

V. Colensoi (Colenso's). *fl.* white, pink, or bluish; corolla tube short, the limb ⅛in. to ⅓in. across; racemes sub-terminal, often compound, pedunculate, hardly longer than the leaves, puberulous. Summer. *l.* spreading or erecto-patent, almost sessile, ⅓in. to 1in. long, very coriaceous, linear-oblong or narrowly oblong-obovate, acute, entire, sometimes glaucous. New Zealand. A small, glabrous, half-hardy shrub.

V. cupressoides (Cypress-like). *fl.* violet, $\frac{1}{16}$in. in diameter, three or four at the end of the slender branchlets; bracts larger than the sepals, both broadly oblong, obtuse, not ciliated. *l.* $\frac{1}{16}$in. long, ovate-oblong, obtuse, not broader than the branch, opposite pairs connate at the base, erect or adpressed, glabrous, fleshy. New Zealand, Middle Island, &c. A dense, much-branched bush, 6in. to 3ft. or 4ft. high. This is known in gardens under name of *V. salicornioides.*

V. decussata (decussate). A synonym of *V. elliptica.*

V. Derwentia (River Derwent). *fl.* light blue or white, rather crowded in racemes often 6in. to 8in. long, in the upper axils; corolla lobes broad, acute, ⅛in. long, obscurely arranged in two lips. June. *l.* sessile, broadly lanceolate, acuminate, 3in. to 4in. long, serrated. Stems 2ft. to 3ft. high. Australia, 1802. Greenhouse. (A. B. R. 531.) SYN. *V. labiata* (B. M. 1660, 3461).

V. diosmæfolia (Diosma-leaved). *fl.* lilac, ⅛in. to ¼in. across; pedicels slender; corymbs terminal, depressed, many-flowered. July. *l.* petiolate, close-set, spreading, rigidly coriaceous, ⅛in. to ⅜in. long, ⅛in. broad, linear-oblong, acute at both ends, entire, not shining, sharply keeled by the midrib below. Branches rather slender. *h.* 3ft. to 12ft. New Zealand, 1835. Greenhouse shrub.

V. elliptica (elliptic).* *fl.* white, large; corolla limb ⅛in. to ⅜in. broad; racemes very short, few-flowered, forming together a loose, sub-corymbose head at the tips of the branchlets. July. *l.* close-set, spreading, uniform, petiolate, ⅛in. to ⅜in. long, linear- or obovate-oblong, truncate at base, entire, flat, not shining. *h.* 5ft. to 20ft. New Zealand, Chili, Fuegia, and Falkland Islands, 1776. Half-hardy shrub or tree. (L. & P. F. G. iii., p. 101.) SYN. *V. decussata* (B. M. 242).

V. epacridea (Epacris-like). *fl.* white, collected into terminal, ovoid, leafy heads; corolla with a long tube, the limb ⅛in. in diameter. *l.* sessile, 4in. in diameter, densely imbricate, spreading and recurved, ⅛in. to ¼in. long, very broadly obovate-oblong, concave, rigid, glabrous, round or sub-acute at the tip. Stem much branched, rigid, tortuous. New Zealand. Half-hardy shrub.

V. formosa (beautiful). *fl.* pale blue, in short, loose racemes in the upper axils, forming terminal, leafy corymbs; corolla lobes ⅛in. or more long. July. *l.* rather crowded, oval-oblong or lanceolate, entire or rarely obscurely toothed, thick, often recurved, ⅛in. to ¼in. long. *h.* 2ft. to 4ft. Australia, 1835. A

Veronica—*continued.*

beautiful, corymbosely-branched, greenhouse shrub. (B. M. 4512; L. J. F. 3; L. & P. F. G. 95.)

V. gentianoides (Gentian-like). *fl.* blue, rather large; pedicels at length ½in. to ¾in. long; racemes elongated, loose, many-flowered, pubescent. June. *l.* rather thick, entire or with a few crenatures, 1in. to 3in. long, the lower ones rosulate, obovate or oblong, the rest remote, oblong or lanceolate. Stems tufted, erect, simple, 6in. to 12in. or more high. Caucasus, 1748. (B. M. 1002; S. F. G. 5.) There is a very pretty variety, *alba*, with white flowers.

V. glauco-cærulea (glaucous-blue).* *fl.* deep blue, changing to purple, in short, few-flowered spikes, crowded together near the tips of the branchlets; corolla limb ¼in. to ⅓in. in diameter; peduncles covered with soft, white hairs. *l.* closely imbricated, ½in. long, obovate-oblong, acute, rather concave, on short, broad petioles. New Zealand. A small, stout, decumbent or sub-erect shrub, much branched, intensely glaucous throughout, with slightly hairy branches.

V. Grievei (Grieve's). A garden hybrid near *V. saxatilis*, resembling that species, but with brighter coloured-flowers. It is more suitable for flower borders.

V. Guthrieana (Guthrie's). A garden hybrid of which one of the parents is *V. saxatilis*.

V. Hulkeana (Hulke's).* *fl.* lilac, sessile; corolla ¾in. broad; spikes spreading, puberulous and glandular, forming long, terminal, opposite-branched panicles, 4in. to 10in. long. Summer. *l.* in distant pairs, 1in. to 1½in. long, oblong-ovate, obtuse or acute, coarsely serrated, rather coriaceous; petioles ¼in. to ⅔in. long. Stem nearly simple, terete. *h.* 1ft. to 3ft. New Zealand, 1865. Half-hardy shrub. (B. M. 5484.)

V. incana (hoary).* *fl.* blue; pedicels much shorter than the woolly calyx; racemes often solitary. July. *l.* petiolate, oblong or lanceolate, narrowed at base, the lower ones obtuse and crenate, the upper ones acute and serrated or entire at apex, both sides (as well as the stem) hoary-tomentose. *h.* 2ft. Russia, 1759. SYN. *V. neglecta* (S. B. F. G. 55).

FIG. 165. VERONICA LONGIFOLIA SUBSESSILIS, showing Habit and single detached Flower.

V. incisa (cut-leaved). *fl.* blue, on pedicels rather longer than the calyx; racemes solitary or paniculate, slender. July. *l.* scattered, pinnatifid to the middle or rather deeper; lobes lanceolate, acute. Stems glabrous or canescent-pubescent. *h.* 2ft. Siberia, 1739. (L. B. C. 1397.)

V. Kirkii (Kirk's). *fl.* pure white, shortly pedicellate, disposed in slender racemes in the axils of the uppermost leaves; corolla tube ¼in. long, the limb ¼in. in diameter; racemes 4in. to 8in. long, dense-flowered. *l.* 1in. to 1½in. long by ¼in. wide, lanceolate, decussate or loosely imbricate, entire, smooth, acute, sessile by a broad base, slightly concave, recurved. *h.* 6ft. to 12ft. New Zealand. A tall, handsome shrub, with dark brown, polished branches.

V. labiata (lipped). A synonym of *V. Derwentia*.

V. lævis (smooth). *fl.* white, ¼in. across; racemes twice as long as the leaves, usually crowded at the ends of the branches,

Veronica—*continued.*

puberulous. *l.* erect and adpressed, imbricating, rarely spreading, ¼in. to ½in. long, ⅛in. to ¼in. broad, broadly obovate-oblong, obtuse or acute, extremely coriaceous, entire, concave, sharply keeled by the stout, prominent midrib; petioles short, very stout. *h.* 2ft. to 4ft. New Zealand. A glabrous shrub.

V. latifolia (broad-leaved). A form of *V. Teucrium*.

V. ligustrifolia (Ligustrum-leaved). *fl.* white, rather large; pedicels slender; racemes about twice as long as the leaves, rather slender, loose-flowered, puberulous. *l.* 1¼in. to 3in. long, usually very narrow, linear-lanceolate, acuminate, ⅛in. to ¼in. broad, flat or concave and keeled at the back, quite entire, sometimes ¼in. to ¾in. broad and obtuse. New Zealand. A large, glabrous, diffusely-branched, greenhouse shrub.

V. Lindleyana (Lindley's). A form of *V. salicifolia*.

V. longifolia (long-leaved). *fl.* lilac; pedicels often shorter than the calyx; racemes solitary or few, dense-flowered. August. *l.* shortly petiolate, opposite or ternately whorled, ovate or cordate at base, ovate- or oblong-lanceolate, acuminate, argutely serrated. Stems glabrous or puberulous. *h.* 2ft. Central Europe, 1731.

V. l. subsessilis (nearly sessile). *fl.* of a beautiful amethystine blue; rachis of the raceme adpressedly-pubescent. *l.* very shortly petiolate, 2in. to 4in. long, simply serrated, adpressedly puberulous beneath. *h.* 2ft. to 4ft. Japan, 1878. See Fig. 165. (B. M. 6407; G. C. n. s. xvi., p. 789; R. H. 1881, p. 270.)

V. Lyallii (Lyall's).* *fl.* white, the veins pink near the throat; corolla nearly ½in. across; pedicels slender, the lower ones ½in. long; peduncles axillary, slender, 3in. to 8in. long, glabrous, many-flowered. Summer. *l.* shortly petiolate, ¼in. to ½in. long, ovate to ovate-lanceolate, obtuse or acute, glabrous, with a few coarse serratures. Stems slender, prostrate and rooting, diffusely branched, 5in. to 15in. long. New Zealand, 1879. Shrub. (B. M. 6456.)

V. lycopodioides (Lycopodium-like). *fl.* white, sessile, disposed in small, dense, oblong heads at the ends of the branches; sepals linear-oblong, obtuse, ciliated; corolla tube very short, the limb ⅛in. in diameter. *l.* very densely and closely imbricate, thickly coriaceous, very broadly reniform-ovate, much broader than long, abruptly narrowed into an acute tip, about $\frac{1}{10}$in. broad; opposite pairs connate at the base. New Zealand. An erect, much-branched, stout shrub.

V. multifida (much-cleft). *fl.* light blue; pedicels scarcely exceeding the calyx; racemes dense-flowered. June. *l.* rarely more than ⅓in. long, once or twice pinnatisect; segments linear or subulate, rarely oblong, narrowed at base. Stems decumbent or diffuse, woody at base, cano-pubescent, 6in. long. Central and Eastern Asia, 1748. (B. M. 1679; J. F. A. 329.)

V. neglecta (neglected). A synonym of *V. incana*.

V. officinalis (officinal). Common Medicinal-tea Speedwell; Fluellen; Ground-hele. *fl.* pale blue or lilac, on very short pedicels; corolla ⅛in. across; racemes slender, many-flowered. May to July. *l.* all opposite, shortly petiolate, obovate-oblong or orbicular, ¼in. to 1in. long, serrated. Stem hairy, decumbent; branches 2in. to 18in. long, ascending. Europe (Britain). (F. D. 248; Sy. En. B. 984-5.)

V. orchidea (Orchis-like). A form of *V. spicata*.

V. orientalis (Eastern). *fl.* flesh-coloured, small, and shortly pedicellate, or blue, larger, and longer-pedicellate; raceme loose. July. *l.* linear, lanceolate, or cuneate-oblong, entire, toothed, or with a few pinnatifid laciniæ, narrowed at base. Stems decumbent or diffuse, woody at base, cano-pubescent or glabrous. Levant, 1748. (L. B. C. 419.) SYN. *V. taurica* (L. B. C. 911).

V. paniculata (panicled). *fl.* blue; pedicels longer than the calyx: racemes numerous, loose, many-flowered, paniculate. June. *l.* mostly opposite or ternately whorled, lanceolate, acute, crenate-serrate, narrowed at base, petiolate or rarely sub-sessile, rather thick, pale, glabrous or scarcely puberulous. Stems 1ft. to 3ft. high, glabrous or canescent-puberulous. South-Eastern Europe, 1797. SYN. *V. amethystina*.

V. parviflora (small-flowered). *fl.* blue, small; corolla ⅛in. to ¼in. across; racemes generally straight, about twice as long as the leaves, dense-flowered, pubescent. May. *l.* erect or spreading, 1in. to 3in. long, lanceolate to linear-lanceolate, flat or concave and keeled, quite entire, acute or acuminate. *h.* 4ft. to 6ft. New Zealand, 1822. Half-hardy shrub. *V. p. augustifolia* (B. M. 5965) is a narrow-leaved form, with lilac flowers.

V. pectinata (comb-like). *fl.* blue; corolla ample; pedicels scarcely longer than the calyx; racemes at length as much as 1ft. long. May. *l.* often small, obovate to oblong-linear, crenate or scarcely incised, narrowed at base. Stems prostrate, cano-pubescent or villous. Syria, &c., 1819.

V. p. rubra (red). A fine variety, with reddish-pink flowers.

V. perfoliata (perfoliate). Digger's Speedwell. *fl.* bluish-violet, streaked with purple, in long, slender racemes in the upper axils;

Veronica—*continued.*

corolla lobes nearly rotate, but obscurely bilabiate. August. *l.* amplexicaul and often more or less connate by their broad bases, ovate or ovate-lanceolate, acuminate or acute, entire or few-toothed, 1in. to 3in. long. Stems simple or slightly branched. *h.* about 3ft. Australia, 1815. Greenhouse perennial or undershrub. (B. M. 1936; B. R. 1930; L. B. C. 781.)

V. pimeleoides (Pimelea-like). *fl.* deep purple, opposite, in the axils of large, leafy, ciliated bracts; spikes short, very pubescent or tomentose, sub-distichous. *l.* sessile, imbricated, erecto-patent, ¼in. to ½in. long, broadly obovate oblong, obtuse, rather concave, obtusely keeled, slightly glaucous. Branches erect, transversely scarred. *h.* 4in. to 10in. New Zealand. A sub-erect, greenhouse shrub.

V. pinguifolia (fat-leaved).* *fl.* white; sepals obtuse, ciliated; spikes very short, pilose and pubescent, crowded in heads at the tips of the branches, very dense-flowered. June. *l.* sessile, imbricated, ¼in. to ½in. long, obovate-oblong, obtuse, entire, very thick and coriaceous, concave, not keeled. Branches pubescent above, transversely scarred. *h.* 4in. to 4ft. New Zealand, 1870. An erect or decumbent, robust shrub. (B. M. 6147; B. M. 6587, under name of *V. carnosula.*)

V. prostrata (prostrate). A form of *V. Teucrium.*

V. salicifolia (Willow-leaved). *fl.* bluish-purple or white, very variable in size and length of corolla tube; pedicels slender; racemes much longer than the leaves, simple, very many flowered, pubescent or glabrate. June. *l.* sessile, 2in. to 6in. long, linear- or oblong-lanceolate, acuminate, entire, glabrous. Branches terete, as thick as a crow-quill. New Zealand. A large, half-hardy, glabrous shrub. *V. Lindleyana* (P. M. B. xii. 247) is a form of this.

V. salicornioides (Salicornia-like). The plant grown under this name in English gardens is *V. cupressoides*; the true *V. salicornioides* has apparently not yet been introduced.

V. satureioides (Satureia-like). *fl.* blue; calyx unequally five-partite; corolla limb sub-bilabiate; raceme spicate, ½in. long. May. *l.* opposite, decussate, crowded, oblong or obovate, ¼in. long; tip slightly toothed. Stems cæspitose; base woody. *h.* 3in. Dalmatia, 1885. (R. G. 1192, fig. 3.)

V. saxatilis (rock-loving). Rock Speedwell. *fl.* bright blue, very beautiful; corolla ½in. across; raceme sub-corymbose, terminal, few-flowered. July to September. *l.* ¼in. to ½in. long, the lower ones obovate, the upper oblong, coriaceous; teeth very few or none. Stem woody; branches many, 2in. to 4in. long, with leafy barren shoots. Europe (Britain). Plant decumbent. (L. B. C. 704; Sy. En. B. 981.)

V. speciosa (showy). *fl.* deep blue-purple; corolla ½in. broad; racemes dense-flowered, 1in. in diameter, not longer than the leaves, stout, erect. May. *l.* sessile or on very short, thick petioles, 2in. to 4in. long, obovate-oblong, rounded at apex, very coriaceous, shining, entire, downy on the midrib above. Branches angled. *h.* 1½ft. New Zealand, 1835. Half-hardy shrub. (B. M. 4057; P. M. B. x. 247.)

V. s. imperialis (Imperial). A very handsome and free-flowering garden variety, producing its purple flowers in large, dense spikes. 1878. (F. d. S. 2317.)

V. s. rubra (red). This differs from the type in having rose-coloured flowers. (F. d. S. 196.)

V. spicata (spike-flowered).* *fl.* bright blue; corolla tube shorter than the calyx; stamens very long, purple; spike dense, 1½in. to 3in. long. July and August. *l.* opposite or whorled, 1in. to 1½in. long, sub-sessile, narrow-oblong or oblong-lanceolate, serrated above the middle. Stem 6in. to 18in. long, stout, erect from a decumbent base, leafy. Europe (Britain), &c. (F. D. 52; Sy. En. B. 982.) *V. orchidea* (B. M. 2210) is a form of this species, with narrow, tortuous corolla segments.

V. syriaca (Syrian). *fl.* blue; corolla rather large; pedicels filiform, several times longer than the calyx; racemes slender, bundle-flowered. June. *l.*, lower ones petiolate, upper ones sessile, ovate or ovate-lanceolate, with a few incised teeth; lower floral ones somewhat conformed, the rest small, entire. Stems ascending or diffuse, branched. Syria, 1857. Half-hardy annual. (B. H. vii. 42; F. d. S. 1259.)

V. taurica (Taurian). A synonym of *V. orientalis.*

V. Teucrium (Teucrium). Hungarian or Saw-leaved Speedwell. *fl.* light blue; calyx segments very unequal; racemes many-flowered. July. *l.* sessile or the lower ones shortly petiolate, ovate to linear, rounded or cordate at base, more or less toothed or sub-pinnatifid. Sterile stems prostrate; floral ones ascending from a decumbent base, or erect, cano-pubescent or villous. South Europe, 1596. A variable species. (B. H. xxx. 7; L. B. C. 425.) There is a prostrate, small-leaved form with bright blue flowers. (B. M. 3683, under name of *V. prostrata.*)

Veronica—*continued.*

V. T. latifolia (broad-leaved). A tall form, with broader leaves than the type. (S. B. F. G. 23, under name of *V. latifolia.*)

V. Traversii (Travers').* *fl.* white; corolla lobes ¼in. across; racemes longer than the leaves, sub-terminal, 1in. to 2in. long, puberulous, many-flowered. Summer. *l.* spreading, sessile, ¾in. to 1in. long, obovate or linear-oblong, acute or obtuse, entire, coriaceous, flat. Branches terete. *h.* 2½ft. New Zealand, 1873. Shrub. (B. M. 6390.)

V. vernicosa (varnished). *fl.* white; racemes crowded at the ends of the branches, puberulous, 1in. to 1½in. long, often peduncled, tapering or caudate; bracts very small. *l.* close-set, spreading, petiolate, ¼in. to ½in. long, ¼in. to ½in. broad, obovate-oblong, obtuse or apiculate, varnished on the upper surface, entire, flat or a little concave. New Zealand. A small, stout, glabrous shrub.

V. virginica (Virginian).* Culver's Physic; Great Virginian Speedwell. *fl.* white, sometimes bluish; corolla salver-shaped; terminal spike 6in. to 10in. long, with usually several shorter ones from the upper axils. July. *l.* in whorls of three to nine, lanceolate, slenderly acuminate, sometimes oblong, very closely and sharply serrated, 3in. to 5in. long. Stems simple, 2ft. to 6ft. high. North America, 1714. (B. M. Pl. 196.) SYN. *Leptandra virginica.*

VERRUCÆFORM. Shaped like a wart.

VERRUCOSE. Warted; covered with wart-like, sessile elevations.

VERSATILE. Turning freely on its support; swinging to and fro.

VERSCHAFFELTIA (named in honour of Ambrosius Verschaffelt, who wrote a work on Camellias in 1848). SYN. *Regelia* (of gardens). ORD. *Palmæ.* A monotypic genus. The species is a handsome, stove Palm, requiring similar culture to **Stevensonia** (which *see*).

V. melanochætes (black-spined). A synonym of *Roscheria melanochætes.*

FIG. 166. VERSCHAFFELTIA SPLENDIDA.

V. splendida (splendid).* *fl.*, spathes three; spadix 3ft. to 6ft. long, on a compressed peduncle 3ft. to 4ft. long; flowering branches 7in. to 8in. long. *l.* 4ft. to 7ft. long, 3ft. to 5ft. broad, cuneate-obovate, bright green, bifid, the edges deeply incised,

Verschaffeltia—*continued.*

the primary veins prominent on both surfaces; petioles 6in. to 12in. long, pale green, semi-terete, grooved down the face; sheaths 2½ft. to 3½ft. long, white-granular. Stem 6in. to 12in. in diameter, and (as well as the leaf-sheaths and petioles) very spiny when young. *h.* 80ft. Seychelles, 1864. See Fig. 166. (F. d. S. 1597-8; I. H. 430; R. G. 1875, p. 308; R. H. 1869, 148.) This has been known in gardens as *Regelia magnifica*, *R. majestica*, and *R. princeps*.

VERTEBRATE. Contracted at intervals, like the vertebræ of animals, there being an articulation at each contraction, as in some leaves.

VERTEX. The apex of an organ.

VERTICAL. Placed in the direction from base to apex.

VERTICIL. A whorl.

VERTICILLASTER. A false whorl, composed, in *Labiatæ*, of a pair of opposite cymes.

VERTICILLATE. Disposed in a whorl; when several bodies form a ring round a common axis: *e.g.*, leaves round a stem; sepals, petals, and stamens round an ovary.

VERTICORDIA (from *verto*, to turn, and *cor*, *cordis*, a heart; a title of Venus, to whom the Myrtle was sacred). Juniper Myrtle. Including *Chrysorrhoe*. ORD. *Myrtaceæ*. A genus embracing thirty-seven species of greenhouse shrubs, with usually the aspect of a Heath or Diosma, glabrous except the cilia on the edges of the leaves, limited to Australia. Flowers whitish, pink, or yellow, usually pedicellate in the upper axils, often corymbose, spicate, or racemose; calyx lobes five, often coloured, elegantly plumose, radiating; petals five, entire, fringed, or digitate; stamens ten, alternating with as many staminodia. Leaves small, opposite or very rarely alternate, entire. A selection of the introduced species is here given. They are of easy culture in a compost of sandy loam and leaf mould. They are readily propagated by cuttings of firm or partially-ripened shoots, inserted under a glass, or in a close frame. An abundance of water and frequent syringings are requisite throughout the summer. The roots should not be allowed to get quite dry at any time.

V. Brownii (R. Brown's). *fl.* white, small, very numerous, in dense, broad, terminal, leafy corymbs, more or less pedunculate; petals shorter than the calyx lobes. April. *l.* obovate or oblong, very obtuse, keeled or triquetrous, $\frac{1}{12}$in. to $\frac{1}{8}$in. long. *h.* 3ft. 1842. Shrub erect, bushy, and much branched.

V. densiflora (dense-flowered). *fl.* white or pink, in dense, terminal, leafy corymbs, usually pedunculate; petals short, nearly orbicular, fringed. June. *l.* linear, semi-terete or triquetrous, slender, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, crowded on the short side branches so as to form axillary tufts as in *V. Fontanesii*, but usually more remote on the main stems. *h.* 2ft. to 3ft. 1860. Shrub erect and bushy.

V. Fontanesii (Desfontaines'). *fl.* white or pink, in terminal, leafy corymbs, or rounded, dense panicles, close above the stem leaves or shortly pedunculate; petals as long as the calyx lobes, slightly pubescent. April. *l.* linear, semi-terete or triquetrous, usually slender, obtuse or mucronate, three to four lines long, densely crowded on the short lateral shoots, or rarely $\frac{1}{12}$in. long and looser. *h.* 3ft. to 4ft. 1826. Shrub erect and bushy. SYN. *Chamælaucium plumosum*.

V. insignis (remarkable). *fl.* pink, on pedicels often more than 1in. long, in loose, irregular, terminal, leafy corymbs; petals orbicular, cilated. April. *l.* broadly ovate to oblong, very obtuse or almost mucronate, two to four lines long, the lower ones, and those of the barren branches, often laterally compressed or vertical. *h.* 1ft. to 2ft. 1839. Shrub erect, branching from the base.

V. nitens (shining). *fl.* golden-yellow, on slender pedicels, in a broad, terminal corymb; petals about as long as the calyx, irregularly toothed. April. *l.* linear, semi-terete, rather slender, acute or mucronulate, mostly $\frac{1}{12}$in. to $\frac{3}{8}$in., but the lower ones sometimes above 1in. long. *h.* 2ft. 1862. Shrub corymbosely branched. (B. M. 5286.) SYN. *Chrysorrhoe nitens*.

VERULAMIA. A synonym of **Pavetta** (which *see*).

VERVAIN. *See* **Verbena.**

VERVAIN, BASTARD. *See* **Stachytarpheta.**

VERVAIN SAGE. *See* **Salvia Verbenaca.**

VESICARIA (from *vesica*, a bladder or blister; alluding to the inflated pods). Bladder Pod or Seed. ORD. *Cruciferæ*. A genus embracing about a score species of mostly hardy, branched, annual or perennial herbs, found in temperate North America, South Europe, Syria, Persia, and the Andes. Flowers yellow or purple, variable in form, large, rarely small; sepals equal at base, or the lateral ones sub-saccate; racemes ebracteate. Pods globose or inflated. Leaves entire, sinuate, or pinnatifid. The species here described are well adapted for ornamenting rockwork. They are of the simplest culture. The annuals may be increased by seeds, and the perennials by divisions.

V. arctica (Arctic). *fl.* yellow, many in dense racemes. August. *l.* oblanceolate and linear-spathulate, of a beautiful silvery colour, clustered. *h.* 1ft. North America, 1828. Perennial. (B. M. 2882.)

V. gracilis (slender). *fl.* yellow; petals spreading, obcordate, nearly sessile; racemes elongated. June. *l.* lanceolate, entire or slightly angular, nearly naked; lower ones sub-spathulate, petiolate. Stems many, filiform, rigid, slightly scabrid. *h.* 6in. Texas, 1834. Annual. (B. M. 3533.)

V. græca (Greek). *fl.*, petals nearly twice as long as the calyx, the lamina yellow, elliptic. Summer. *l.* of the sterile branches thick, oblong-spathulate, slightly acute; those of the fertile stems sessile, erect, acute, the margins ciliated and often denticulate. Greece. Perennial. SYN. *Alyssum utriculatum*.

V. grandiflora (large-flowered).* *fl.* yellow, large; petals rounded, spreading, very shortly clawed; racemes elongated, many-flowered. July. *l.* oblong; radical ones sub-lyrately pinnatifid, petiolate; cauline ones sinuate-toothed, sessile. Stem erect, flexuous. *h.* 1ft. Texas, 1835. A stellately-pubescent annual. (B. M. 3464; S. B. F. G. ser. ii. 401.)

FIG. 167. VESICARIA UTRICULATA, showing Habit and detached Flower.

V. utriculata (bladder-podded).* *fl.* yellow, closely resembling the Wallflower; calyx bisaccate at base. April to June. *l.* oblong, quite entire, smooth; lower ones ciliated, somewhat spathulate. *h.* 1ft. South Europe, 1730. Perennial. See Fig. 167. (S. F. G. 627.)

VESICLE. A small bladder or air cavity.

VESICULAR, VESICULATE, VESICULOSE, VESICULÆFORM. Inflated; bladdery; appearing as if composed of little bladders.

VESLINGIA (named after John Vesling, 1598-1649, a traveller in the East, and Professor of Botany at Padua). SYNS. *Guizotia* (the proper name, according to Bentham and Hooker), *Ramtilla*. ORD. *Compositæ*. A small genus (three species) of tropical African, stove, annual herbs. Flower-heads yellow, at the tips of the branches or pedunculate in the upper axils, heterogamous;

Veslingia—*continued.*

involucral bracts somewhat biseriate; receptacle convex or conical; ray florets ligulate, three-toothed at apex; achenes glabrous. Leaves opposite or the upper ones alternate, entire or toothed. Only one species calls for description here. It thrives in any rich soil, and may be increased by seeds.

V. sativa (cultivated). *fl.-heads* golden-yellow, 2in. across, rather handsome; involucre simple, of five leaflets. August and September. *l.* amplexicaul, cordate-lanceolate, remotely serrated. *h.* 6ft. 1806. SYN. *Verbesina sativa.* (B. M. 1017.) *Guizotia oleifera* is now the correct name of this plant.

VESPA. *See* **Wasps.**

VESPERTINE. Appearing or expanding in early evening.

VESPUCCIA (commemorative, in honour of Amerigo Vespucci, 1451-1512, after whom America is named). *Hydrocleis* is now the correct name of this genus. ORD. *Alismaceæ.* A small genus (three or four species) of highly glabrous, stove, aquatic herbs, inhabiting tropical South America. Flowers solitary, large, hermaphrodite, on long, thick peduncles; perianth segments six, the three outer ones (sepals) persistent, the three inner ones (petals) yellow, larger, very slender, deciduous; stamens numerous, hypogynous, in many series. Leaves fascicled, floating, ovate- or cordate-orbicular, the nerves converging at the apex; petioles thick, sheathing at base. *V. Humboldtii*, the only species calling for description here, is of easy culture in a tub or cistern of water. It may be readily increased by seeds, or by runners.

V. Humboldtii (Humboldt's). *fl.*, sepals narrow-ovate, obtuse; petals broadly obovate-cuneate, ample; stamens numerous, fertile or sterile; peduncles springing from the nodes, one-flowered. May. *l.*, both radical and cauline ones broadly ovate or sub-orbicular, obtuse, loosely cordate at base, 2in. to 3½in. long, 1½in. to 2½in. broad, coriaceous; petioles terete, 4in. to 6in. long. Venezuela to Buenos Ayres. SYN. *Limnocharis Humboldtii* (B. M. 3248; B. R. 1640). *Hydrocleis Commersoni* is now the correct name of this plant.

VESSELS. In the vascular system of vascular plants (*i.e.*, the flowering plants and higher Cryptogams), Vessels are found plentifully; but they do not occur in any groups of plants lower than the Ferns and their allies, though the laticiferous cells of a few Fungi are a good deal like them in appearance.

Vessels may be grouped as follows: 1. True Vessels, being those of the fibro-vascular bundles, which compose the vascular system. These comprise (*a*) Vessels of the Wood ("xylem") and (*b*) Vessels of the Bast ("phloem"), or sieve-tubes. 2. Vessels of the Cellular Tissue, or Ground Tissue, scattered through the pith and cortex of the roots and stems, and among the green cells of leaves. These three classes of Vessels differ materially in their nature, contents, and uses. The two classes of true Vessels agree in being present in all complete fibro-vascular bundles; and also in being always formed by the absorption of the walls that separate elongated cells placed in rows, either end to end, or overlapping more or less at the tapering ends, so that tubes are thus formed of indefinite length. In most Vessels it is easy to trace the cells of which they are formed by the marks that remain on the walls where the cells meet. The Vessels of the Wood differ from those of the Bast in several important respects. But before stating these it may help to elucidate the subject if a brief account of the ordinary structure of fibro-vascular bundles is given.

We shall select for description such a bundle as may be found in the stems of many Monocotyledons. In these plants the bundles usually remain separated from one another, during their whole existence, by the cellular tissue in which they are imbedded; and after they are once formed they do not undergo changes, so that the arrangement of the cells and Vessels of which they are built up is little, if at all, altered during growth. The simplest bundles of this kind consist of a group of the Vessels

Vessels—*continued.*

of the Wood (called "tracheæ"), united with a group of Vessels of the Bast ("sieve-tubes"); but in most parts of plants these are accompanied by cells, some of which are elongated and slender (fibre-cells or "prosenchyma") while others are little, if any, longer than broad ("parenchyma"). Some of the cells usually remain thin-walled; but others have the walls much thickened by deposits upon the inner surface, and then the tissue is called "sclerenchyma." This tissue adds to the strength of the bundle, being arranged alongside the Vessels (as wood-fibres or hard-bast fibres), or forming a sheath surrounding the bundle entirely or in part. The commonest position of the wood and bast of each bundle, as seen in transverse section, is that in which the wood lies nearer the centre of the stem, and the bast nearer the circumference; but in some plants there is bast inside, but not outside, of the wood, or there may be bast both inside and outside, or even all round the wood. Less often the bast lies in the middle, with the wood all round it. The arrangements in leaves correspond with those in stems. If the leaf is held erect, with the upper surface next the stem, that surface is nearer the centre of the stem, and the lower surface is further from it. In accordance with this, the Wood-vessels of each bundle are usually nearer the upper surface, and the bast nearer the lower surface of the leaf. In roots the earliest bundles to appear (called the primary wood-bundles), consist entirely of Wood-vessels, which are formed successively nearer and nearer the centre of the root, increasing in size as they come nearer to the centre. Between them, and at the same distance from the centre as they are, the bast is formed; hence, the root is markedly different from the stem in the arrangements of the bundles. In the stems and roots of Monocotyledons, the bundles early assume the appearance and structure that they permanently retain; but in woody Dicotyledons and Conifers, changes occur after the first year of growth, which greatly affect their original appearance. In each bundle in the stem, the wood and the bast are separated by a layer of thin-walled cells (the "cambium") which continues to form new cells by divisions parallel to its surfaces, producing new wood to the outside of the older wood, and new bast to the inside of the older bast. The cambium forms a complete cylinder around the wood of the stems of these plants, and gives origin to ring above ring of wood, usually one in each year of growth. The bundles grow so large that they are separated only by narrow belts of cells (medullary rays), the oldest of which runs from the pith in the centre to the cortex outside the bast; while the new rays formed each year run from the inner border of the ring of wood to the cortex. The fibro-vascular bundles can scarcely be separated, after a time, from one another; but the wood and the bast are easily disunited in most Dicotyledons at the cambium, as the cells of this ring readily give way, and the bark is thus easily separable from the wood. The bast forms the innermost layer of the bark, and its connection with the wood tends to become less evident than it was before the bundles were united by the continuous cambium

In the roots of Dicotyledons and Conifers, the earliest-formed wood-bundles do not grow; but there is a layer of cambium to the inside of each bast bundle, and soon this layer begins to form wood from its inner surface, and bast from its outer. After a short time, the cambium forms a continuous layer like that in the stem, and the roots in cross-sections look much like stems, except that the pith in the centre is often small or wanting, and that a practised eye can usually detect the primary wood-bundles lying close to the centre, and free from the bundles formed by the cambium.

We must now pass to the various kinds of Vessels met with in the wood and the bast. In the wood of all

Vessels—*continued.*

bundles there are "spiral" or "annular" Vessels. These are long, slender tubes, which appear round in transverse section. They frequently show very slight traces of the cells of which they were built up. The characteristic feature in them is the existence of a peculiar thickening deposit in the vessel, which, in a longitudinal section of the bundle, is not unlike a glass tube inclosing a closely-wound spiral wire, or wire rings; or a more familiar comparison may be made with an indiarubber tube, kept open by a wire spirally coiled in its interior. Besides spiral and annular Vessels, the wood-bundles very generally contain others, in which the thickening deposits are laid down on the inner surface of the walls in the form of a more or less regular network ("reticulated Vessels"), or of the steps of a ladder ("scalariform Vessels" of Ferns and their allies), or covering the wall, so as to leave only narrow tubes or pits through the new layers ("pitted or dotted Vessels," or "Ducts"). All these Vessels show an angular form in transverse section; and they are generally wider than the spiral Vessels. They also show distinctly the boundaries of the cells of which they are built up; though the openings from cell to cell are always relatively large. Spiral and annular Vessels are very rarely formed by the cambium; hence, in Dicotyledons and in Conifers, they are present in the stems and roots usually only in the earliest-formed wood —*i.e.*, they surround the pith; and, at one period, they were supposed to form around the pith a peculiar organ, which was called the "medullary sheath." In Dicotyledons, the Vessels in the wood formed by the cambium are almost all reticulated, dotted, or pitted. In Conifers, very few Vessels are formed by the cambium, their work being done by wood-cells, with openings from one to the other of a peculiar nature. All the characteristic Vessels of the Wood very soon lose their protoplasm, and contain only air or sap, or, more generally, both air and sap. The walls of fully-formed Wood-vessels are lignified and firm.

The Vessels of the Bast are very distinct from those of the wood. They are always present in the soft bast (though not always easily detected, except by an expert microscopist); but a few may also be found in some plants in the pith or the cortex. They assume the form of slender tubes, with thin, flexible walls, unmarked by thickening deposits. The walls separating the cells that make up these Vessels are not entirely absorbed (as is the case in the Wood-vessels). They can always be recognised as cross-partitions; but they are pierced by numerous small openings, so as to resemble a sieve, whence they are called "sieve-plates," and the Vessels are called "sieve-tubes." Often, the side walls of adjoining tubes also show sieve-plates. The sieve-tubes retain their protoplasmic contents; and the protoplasm extends through the sieve-plates. Sachs believes that the new protoplasm is largely produced in the sieve-tubes; and there is no doubt that they are the channels by which the protoplasm is chiefly, if not entirely, carried from one part of a plant to another, as may be required during growth.

The Vessels of the ground-tissue are of far less general occurrence than those of the vascular system; and they are very different from these in their nature, if we except the small, scattered bundles of sieve-tubes that traverse the ground-tissues of certain plants. The only form of ground-tissue Vessels that calls for special mention is that containing "latex," from which the Vessels themselves are called "Laticiferous Vessels." They exist only in certain orders of plants, chiefly among Dicotyledons, *e.g.*, *Campanulaceæ*, many *Compositæ*, *Euphorbiaceæ*, *Ficoideæ*, *Papaveraceæ*. Among Monocotyledons, they can scarcely be said to exist in their characteristic form, or with their characteristic contents. Laticiferous Vessels vary in their mode of origin in different plants. In most (*e.g.*, Poppies, Dandelion), they are formed, like other Vessels, by the union of cells, of which the dividing-walls are entirely or partially absorbed. Thus very irregular Vessels are formed, which unite freely with one another by branches, so as to form a copious network, with free inter-communication. The walls of these Vessels seldom show thickening deposits. In a few orders (*Asclepiadeæ*, *Euphorbiaceæ*), the Laticiferous Vessels are probably formed, not by the union of cells, but by the elongation and branching of cells, which are not divided by cross-partitions, and which thus reach a very great length. It is believed, by many botanists, that the Laticiferous Vessels of some plants (*e.g.*, *Rhus*) are really intercellular spaces, into which the latex is poured. The Laticiferous Vessels frequently accompany the sieve-tubes, and may even take their place to some extent. In those Monocotyledons that possess latex, it is contained in rows of large cells, separated by walls, in which perforations have not been clearly made out (*Allium Cepa*); or, in those plants (*Galanthus*) in which the Vessels consist of cells, with perforated walls, the contents do not resemble latex, but are only clear sap, with raphides, *i.e.*, slender crystals of Oxalate of Lime. The latex, in Dicotyledons, is a peculiar fluid, which at once appears on breaking any part of a plant in which it exists. It is clear while in the uninjured tissues; but on exposure to the atmosphere, on a broken surface, it becomes turbid. It is then white, like milk, in most plants; but in some it is coloured yellow (*Chelidonium*) or orange by pigments in it. The microscope shows that it is chiefly composed of watery sap, in which float myriads of extremely minute granules: these, as in milk, are the cause of its opaque, white appearance when exposed to the air. On continued exposure to the air, or mixture with alcohol, acids, &c., masses separate from the latex in the form of "coagula," which usually become dark in colour. These coagula often afford useful products, *e.g.*, Opium, and Caoutchouc, or Indiarubber. They vary considerably in composition, texture, and properties. The latex usually has dissolved in it small quantities of sugar, gum, protoplasm, and alkaloids; and starch granules are present in the latex of some plants (*Euphorbia*). In the Papaw (*Carica Papaya*), there is a peculiar substance ("papayotin") dissolved in the latex, which exerts a digestive action on muscular fibre. It is believed by many botanists that the Laticiferous Vessels may be of the same use in plants that veins are in animals; but the plants that possess them are comparatively few, and there is never a central organ for propelling the latex, as the heart propels the blood. The latex, like the blood, contains substances employed in the nutrition of the plant, and also substances that must be regarded as mere excretions formed during the processes of growth, and that would be hurtful if allowed to remain in the cells. Laticiferous Vessels are confined to the higher plants; but Laticiferous cells occur among some of the cellular Cryptogams, and notably in the genus *Lactarius*, among Mushrooms.

VESTIA (named in honour of L. C. de Vest, 1776-1840, Professor at Grätz). ORD. *Solanaceæ*. A monotypic genus. The species is an interesting, erect, glabrous, much-branched, greenhouse shrub. For culture, *see* **Cestrum.**

V. lycioides (Lycium-like). Chilian Box-thorn. *fl.* yellow, solitary or few at the tips of the branches, pendulous; calyx shortly five-toothed, ¼in. long; corolla tube 1in. long, the limb of five induplicate-valvate lobes; stamens five, exserted. June. *l.* entire, oblong or obovate, shining, slightly fleshy, 1½in. to 3in. long; petioles about ¼in. long, channelled above. *h.* 3ft. Chili, 1815. (B. M. 2412; B. R. 299.)

VETCH. *See* **Vicia.**

VETCH, BASTARD OR BLADDER. *See* **Phaca.**

VETCH, BITTER. *See* **Orobus.**

VETCH, CHICKLING. *See* **Lathyrus sativus.**

VETCH, CROWN. A popular name for **Coronilla** (which *see*).

VETCH, LIQUORICE. A common name for **Astragalus glycyphyllos** (which *see*).

VEXILLUM. The standard or large posterior petal in a papilionaceous corolla.

VIBORGIA (named in honour of Eric Viborg, 1759-1822, Professor of Botany at Copenhagen). Syn. *Wiborgia.* Ord. *Leguminosæ.* A genus consisting of seven species of South African, rigid, sometimes spiny, greenhouse

Fig. 168. Flowering Branchlet of Viburnum macrocephalum Keteleeri.

VETCH, MEDICK. A common name for **Onobrychis** (which *see*).

VETCH, MILK. *See* **Astragalus.**

VEXILLARY. An æstivation in which one piece is considerably larger than the others, and is folded over them, they being arranged face to face, as in papilionaceous flowers.

shrubs. Flowers yellow, in terminal, often unilateral racemes; calyx teeth sub-equal; standard ovate or orbicular; keel incurved; bracts and bracteoles small or inconspicuous. Pods stipitate, flat, indehiscent. Leaves digitately trifoliolate. Only one species calls for mention in this work. It thrives in a mixture of sandy loam and fibry peat. Cuttings of young shoots should be inserted in sandy soil, under a glass, in May.

Viborgia—*continued.*

V. obcordata (obcordate-leafleted). *fl.*, racemes terminal or spuriously lateral, 3in. to 8in. long, densely many-flowered. July. *l.* rather distant; leaflets cuneate-oblong, obtuse or emarginate, the young ones thinly silky, the older ones glabrate. Branches long, twiggy, graceful. *h.* 3ft. to 6ft. SYN. *Crotalaria floribunda* (L. B. C. 509).

VIBURNUM (the old Latin name used by Virgil, &c.). Including *Tinus*. ORD. *Caprifoliaceæ*. A genus comprising about eighty species of mostly hardy, deciduous trees and shrubs, indigenous in North temperate and subtemperate regions and the Andes, rare in the West Indies and Madagascar. Flowers white or pinkish, articulated with the pedicels, one or two-bracteolate, disposed in axillary or terminal, sub-umbellate corymbs or panicles, hermaphrodite, or the outer ones larger and neuter; calyx tube turbinate or ovoid, the limb short, equally five-toothed, persistent; corolla rotate, campanulate, or tubular, the limb of five equal, imbricated lobes; stamens five, inserted in the corolla tube (in one species biseriate); filaments short or elongated; anthers oblong, exserted; disk none. Drupe dry or fleshy, ovoid or globose, terete or compressed, one or spuriously two or three-celled, one-seeded. Leaves opposite, very rarely ternately whorled, petiolate, entire, serrated or dentate; stipules inconspicuous or obsolete, in a few cases ample. The culture is of the easiest description. The species thrive in almost any soil, and may be readily propagated by layering, or by cuttings of the half-ripened shoots, inserted in sandy soil, under handlights, in a somewhat shady position. The best-known species are here described; except where otherwise indicated, they are hardy, deciduous shrubs with white flowers, from North America.

V. acerifolium (Maple-leaved). Dockmackie. *fl.*, cymes small, on slender peduncles. May and June. *fr.* crimson, turning purple, with a flattened stone. *l.* coarsely toothed and somewhat three-lobed, roundish, the base truncate or cordate, the pointed lobes diverging. *h.* 3ft. to 6ft. 1736. (W. D. B. 118.)

V. cotinifolium (Cotinus-leaved). Indian Wayfaring-tree. *fl.* small; corymbs 2in. to 3in. in diameter, generally terminal, dense, the branches stellately tomentose. June. *l.* ovate or elliptic, obtuse at base, nearly entire, rarely coarsely crenate, usually woolly beneath. *h.* 5ft. to 10ft. Himalayas, 1830. (B. R. 1650.)

V. dentatum (toothed-leaved).* American Arrow-wood. *fl.* in pedunculate cymes. June. *fr.* blue or purple, small, ovoid. *l.* broadly ovate, slightly cordate at base, very numerously and sharply toothed, pale, often with hairy tufts in the axils of the straight veins; petioles slender. *h.* 5ft. to 10ft. 1763. (W. D. B. 25.)

V. dilatatum (dilated).* *fl.* ¼in. in diameter, very shortly pedicellate; cymes sessile or on stout peduncles, much branched, 2in. to 6in. in diameter. June. *l.* variable, 2in. to 5in. long, orbicular to obovate, usually abruptly and obtusely pointed, coarsely toothed, rounded or cordate at base, slightly hairy; petioles ½in. long. *h.* 10ft. Japan, 1845. A very handsome shrub. (B. M. 6215.)

V. edule (edible). A synonym of *V. Opulus*.

V. Fortunei (Fortune's). A garden synonym of *V. macrocephalum*.

V. Keteleeri. *See* **V. macrocephalum Keteleeri.**

V. Lantana (pliant). Common Wayfaring-tree. *fl.* ½in. in diameter, all perfect; cymes flat-topped, with stout rays. May and June. *fr.* black, flattened, ¼in. long. *l.* broadly oblong-cordate, 2in. to 4in. long, serrulated, rugose, obtuse, exstipulate. *h.* 6ft. to 20ft. Europe (Britain). Shrub scurfily pubescent. (J. F. A. 341; Sy. En. B. 640.)

V. L. foliis-variegatis (variegated-leaved). *l.* variegated with white and yellow.

V. lantanoides (Lantana-like). American Wayfaring-tree; Hobble Bush. *fl.* handsome, in very broad and flat, sessile cymes, the outer flowers much the larger. May. *fr.* red, turning darker, ovoid. *l.* round-ovate, 4in. to 8in. across, abruptly pointed, cordate at base, closely serrated, pinnately many-veined, the veins beneath (as well as the stalks and branchlets) rusty-scurfy. 1820. A straggling shrub, the reclining branches often rooting. (L. B. C. 1570.

Viburnum—*continued.*

V. Lentago (Lentago). Sheep Berry; Sweet Viburnum. *fl.* all perfect, in a sessile cyme. May and June. *fr.* black, or with a blue bloom, edible, sweet, oval, ½in. or more long. *l.* ovate, strongly pointed, closely and very sharply serrated; petioles long and margined. *h.* 15ft. to 30ft. 1761. Tree. (W. D. B. 21.)

V. macrocephalum (large-headed).* *fl.* in compound, sub-pyramidal cymes, the neuter flowers large. June. *l.* ovate, flat, obtuse, denticulate, slightly scabrous, beneath (as well as the branches, petioles and peduncles) stellately furfuraceous-pubescent. *h.* 20ft. China, 1844. (B. R. 1847, 43; F. d. S. 263, 264.) SYN. *V. Fortunei* (of gardens).

V. m. Keteleeri (Keteleer's). This is the wild type, and bears the same relationship to *V. macrocephalum* that the wild *V. Opulus* does to the garden *V. O. sterilis*. See Fig. 168. (R. H. 1863, 31.)

V. molle (soft). *fl.* in pedunculate, stellate-pubescent cymes. July. *fr.* purple or blue, ovoid, small, oily. *l.* broadly oval, obovate, or ovate, scarcely pointed, slightly cordate at base, coarsely crenate or repand-toothed, the lower surface, as well as the rather slender petioles and branchlets, softly downy. *h.* 6ft. to 12ft. 1812.

V. nudum (naked). American Withe Rod. *fl.* all alike and perfect; cyme shortly pedunculate. May and June. *fr.* black, or with a blue bloom, globose, sweet, round-ovoid, ¼in. long.

FIG. 169. FLOWERING BRANCHLET OF VIBURNUM OPULUS STERILIS.

l. rather thick, oval, oblong, or lanceolate, not shining, the margins entire, repand, or crenate. *h.* 6ft. to 10ft. 1752. (B. M. 2281; W. D. B. 20.)

V. n. cassinoides (Cassine-like). *l.* more opaque, often toothed. 1761. (W. D. B. 24, under name of *V. squamatum*.)

V. n. Claytoni (Clayton's). *l.* nearly entire, the veins somewhat prominent beneath.

V. obovatum (obovate-leaved). *fl.* in small, sessile cymes. May. *fr.* black, or with a blue bloom, sweet, ovoid-oblong. *l.* obovate or spathulate, obtuse, entire or denticulate, rather thick, 1in. to 1½in. long, shining. *h.* 2ft. to 8ft. 1812. (L. B. C. 1476.)

V. odoratissimum (very odorous).* *fl.* with the scent of *Olea fragrans*; corymbs 2in. to 4in. high, usually pedunculate. May. *fr.* ovoid-oblong, ½in. by ⅓in., hardly compressed. *l.* elliptic, 5½in. long, acute, cuneate at base, entire or sparingly sinuate-toothed, coriaceous, glabrous; petioles stout, ½in. to 1in. long. *h.* 6ft. to 10ft. Khasia Mountains, China, &c. 1818. Half-hardy. (B. R. 456.)

V. Opulus (Opulus).* Cranberry-tree; Dog Eller; Dog Rowan-tree; Guelder Rose; Marsh or Water Elder; Snowball-tree. *fl.*, outer ones white, ¾in. in diameter; inner ones creamy-white, ¼in. in diameter; cymes sub-globose, 2in. to 4in. in diameter. June and July. *fr.* red, globose, translucent, ¼in. in diameter. *l.* 2in. to 3in. long, three-lobed, stipulate, the young ones downy; lobes unequal, serrated; stipules glandular, adnate to the petioles. Branches slender, lenticellate. *h.* 6ft. to 8ft. Europe (Britain) and North America. (F. D. 661; Sy En. B. 639.) SYNS. *V. edule* *V. oxycoccos* (L. B. C. 1123).

Viburnum—*continued.*

V. O. foliis-variegatis (variegated-leaved). *l.* variegated with white and yellow.

V. O. nana (dwarf). A very distinct little plant, scarcely 1ft. in height.

V. O. sterilis (sterile).* Garden Guelder Rose; Snowball-tree. *fl.*, nearly the whole cyme consisting of radiant, sterile flowers, and becoming globular. A very handsome shrub. See Fig. 169.

Viburnum—*continued.*

obtuse or sub-acute, slightly revolute-margined, crenulate-serrulate. Branches terete, erect. *h.* 6ft. to 7ft. Japan, 1875. (B. M. 6172.) SYN. *V. suspensum.*

V. suspensum (uncertain). A synonym of *V. Sandankwa.*

V. Tinus (Tinus).* Laurustinus. *fl.* white, but rose-coloured before expansion, and sometimes a little time afterwards: corymbs flat. December to March. *fr.* dark blue. *l.* ovate-

FIG. 170. FLOWERING BRANCHLET OF VIBURNUM PUBESCENS.

V. orientale (Eastern). *fl.* in terminal, not radiant, corymbs. July. *fr.* oblong, compressed. *l.* three-lobed, acuminate, coarsely and bluntly toothed; petioles glandless, glabrous. *h.* 6ft. to 10ft. Caucasus, 1827, 1868. (R. G. 567.)

V. oxycoccos (Cranberry-fruited). A synonym of *V. Opulus.*

V. plicatum (plaited).* *fl.* radiant, in the cultivated plant all sterile, dilated, and crowded in globose cymes resembling those of the Guelder Rose. May. *l.* rounded at base, ovate or somewhat ovate-orbicular, cuspidate, coarsely serrated, somewhat plicate, dark green, glabrous above, tomentose beneath. *h.* 4ft. to 6ft. Japan, 1846. (B. R. 1874, 51; F. d. S. 278; G. C. n. s., vi., p. 141; L. J. F. 88; L. & P. F. G. 29; S. Z. F. J. 37.)

V. p. tomentosum (tomentose). This differs from *V. plicatum* in its more hairy leaves, and in the sterile flower being generally confined to the outer part of the inflorescence. (S. Z. F. J. 38, under name of *V. tomentosum.*)

V. prunifolium (Prunus-leaved).* American Black Haw. *fl.* in a sessile cyme. May. *fr.* similar to, or rather smaller than, that of *V. Lentago.* *l.* oval, obtuse or slightly pointed, finely and sharply serrated, 1in. to 2in. long. 1731. A tall shrub or small tree. (W. D. B. 23.)

V. pubescens (downy). *fl.* in pedunculate cymes. June. *fr.* dark purple, small, ovoid. *l.* ovate or oblong-ovate, acute or acuminate, the veins and teeth fewer and less conspicuous than in *V. dentatum*, the lower surface and the very short petioles softly downy, at least when young. 1736. Low and straggling. See Fig. 170.

V. rugosum (wrinkled-leaved). *fl.* all fertile; corymbs not radiant; general involucre seven-leaved. December to March. *fr.* ovate-oblong. *l.* broad, ovate, wrinkled, hairy. *h.* 4ft. to 6ft. Canary Islands, 1796. A half-hardy, evergreen shrub, very like *V. Tinus*, but having leaves larger, and hairy all over. (B. M. 2082; B. R. 376; L. B. C. 859.)

V. Sandankwa (Sandankwa). *fl.*, corymbs mostly terminal, sometimes axillary, short, small, erect, trichotomous. June. *fr* red, globose. *l.* shortly petiolate, ovate or ovate-oblong, oblong, quite entire; ramifications of the veins beneath, as well as the branchlets, glandular-hairy. *h.* 8ft. to 10ft. South Europe, &c., 1596. Evergreen. See Fig. 171. (B. M. 38.)

V. T. Froebelii (Froebel's). A compact form, with lighter green leaves and whiter flowers than the type.

FIG. 171. FLOWERING BRANCHLET OF VIBURNUM TINUS.

Viburnum—*continued.*

V. T. hirtum (hairy). *fl.* appearing in autumn, and persistent through the winter. *l.* oval-oblong, hairy beneath and on the margins.

V. T. lucidum (clear-leaved).* *fl.* and cymes larger than in the type. Spring. *l.* also larger, ovate-oblong, glabrous, shining. Mount Atlas. There is a form having leaves more or less variegated with white.

V. T. strictum (erect). A variety of somewhat erect and fastigiate habit. Gardens. There is also a variegated sub-variety.

V. T. virgatum (twiggy). *l.* oblong-lanceolate, pilose below and on the margins. Italy.

VICIA (the old Latin name used by Virgil, &c.). Tare; Vetch. Including *Ervum*. *Faba* is also included, by the authors of the "Genera Plantarum," under this genus, but is kept distinct in this work. ORD. *Leguminosæ*. A genus comprising about 100 species of mostly hardy, annual or perennial herbs, of variable habit, dispersed over North temperate regions and South America. Flowers often blue, violet, or yellowish-white, axillary, racemose; calyx teeth sub-equal, or the lower longer; standard obovate or oblong, emarginate; wings adnate to the keel; bracts very caducous. Pods compressed, two-valved. Leaves abruptly pinnate; leaflets usually numerous, entire or toothed at the tip; petiole often ending in a tendril. The following species are British: *V. angustifolia, V. bithynica, V. Cracca, V. hirsuta* (Common Tare). *V. lathyroides, V. lutea, V. Orobus* (Bitter Vetch), *V. sativa* (Common Vetch; Fitch; Fitches), *V. sepium, V. sylvatica* (Wood Vetch), *V. tetrasperma*. *V. hybrida* and *V. lævigata*, formerly found in England, are now extinct. *V. sativa* is extensively grown as fodder for cattle. Few of the species are of any horticultural value. Those described below are of simple culture in common garden soil. They may be increased by seeds, the perennials also by divisions.

V. argentea (silvery).* *fl.* pinkish, the tip of the keel spotted with black, secund, rather loose; peduncles many-flowered. June. *l.* cinereous-silvery, without tendrils; leaflets oblong-linear, mucronate. Stem tetragonal. *h.* 1ft. Pyrenees, 1827. Perennial. (B. M. 2946.)

V. atropurpurea (dark-purple). *fl.* purple, secund, approximate; calyx teeth bristly; peduncles many-flowered, scarcely as long as the leaves. June. *l.*, leaflets oblong, mucronate, opposite or alternate; stipules often toothed at base. Stem tetragonal. *h.* 3ft. Algiers, 1815. A villous annual. (B. R. 871.)

V. Cracca (Cracca). Cow Vetch; Tufted Vetch. *fl.* bright blue, ½in. long, drooping; racemes dense, ten to thirty-flowered, unilateral; peduncles longer than the leaves. June to August. *l.* 1in. to 4in. long, sessile, linear-oblong, acute or mucronate. Stems 2ft. to 6ft. long, scandent or diffuse. Europe (Britain). Perennial. (F. D. 804; Sy. En. B. 385.)

V. galegifolia (Galega-leaved). A synonym of *Swainsona galegifolia*.

V. lathyroides (Lathyrus-like). Spring Vetch; Strangle Tare. *fl.* lilac-coloured, solitary, sessile, ¼in. to ½in. long; calyx teeth subulate. May and June. *l.* ½in. to 1in. long; leaflets two or three pairs, linear-oblong or obovate, acute, obtuse, or notched. Stem 6in. to 8in. long, spreading. Europe (Britain). A hairy annual. (Sy. En. B. 395.)

V. onobrychioides (Onobrychis-like).* *fl.* purple, distant; calyx teeth lanceolate; peduncles very long, many-flowered. June. *l.* numerous, linear, alternate or opposite, obtuse or mucronulate. Stem striated. *h.* 2ft. South Europe, 1759. Annual. (A. F. P. 42; B. M. 2206.)

V. oroboides (Orobus-like). *fl.* of a very beautiful blue, usually three or four racemes standing together; peduncles many-flowered, axillary. June. *l.*, leaflets ovate, mucronate. *h.* 1ft. to 2ft. Siberia, 1758. Perennial. SYN. *Orobus lathyroides* (B. M. 2098).

V. polysperma (many-seeded). *fl.* pale blue, erect, loosely racemose; calyx teeth unequal; peduncles eight to ten-flowered, and longer than the leaves. June. *fr.*, pods linear-lanceolate, fourteen to twenty-seeded. *l.*, leaflets fourteen to sixteen, ovate-oblong, obtuse, entire, mucronate, glabrous. Tendrils decompound. Stems 6ft. to 8ft. long, much-branched. Naples, 1833. Climbing annual. (S. B. F. G. ser. ii. 274.)

V. sicula (little dagger). *fl.* of a fine purple, large, secund, numerously disposed on pedunculate racemes. May. *l.* leaflets linear, bluntish, mucronulate, rather silky beneath. Stem tetragonal, almost simple, creeping. 1827. (B. M. 4943 and S. B. F. G. 289, under name of *Orobus Fischeri*.)

V. tenuifolia (slender-leaved). *fl.* violet; calyx teeth unequal; racemes clustered, secund; peduncles many-flowered, longer than the leaves. June. *l.*, leaflets linear, alternate or opposite, nearly glabrous, mucronate. Stems branched. *h.* 1½ft. Germany and Tauria, 1799. Climbing perennial. (B. M. 2141.)

VICTORIA (named after Her Majesty Queen Victoria). ORD. *Nymphæaceæ*. A monotypic genus. The species—a gigantic, handsome, prickly, aquatic, stove herb, with a thick rhizome—is one of the most remarkable productions of the vegetable kingdom. It is found, growing in still water of about 4ft. to 6ft. in depth, in equinoctial America. The peculiar formation of the under surface of the leaves imparts to them great buoyancy—sufficient, for instance, to withstand the weight of a good-sized child sitting in a chair, provided, by means of a flat board, the pressure be equally distributed over the whole of the leaf. In this country, at any rate, it is best to treat the Victoria as an annual, as it is difficult to keep alive during dull, sunless weather in winter. The seeds—which should be kept in a vessel of water until ready for sowing—should be placed in loamy soil, and the pot containing them submerged a couple of inches in a "nursery" tank of water, the temperature of which should not be allowed to fall below 85deg. The tank, too, should be in as light a position, and as near the glass, as possible. It is desirable to sow the seeds in January, and as soon as the seedlings appear, prick them singly into small pots, gradually shifting into larger pots as the plants grow stronger. About the beginning of May, the best plant will probably be ready to place out in the large tank. Two or three cartloads of good, strong loam, with a good proportion of rotted cowdung, will be necessary to enable the plant to attain its full size. After it is fairly established, the temperature of the water may be allowed to fall to 80deg., but not below. All the sunlight possible is needed to keep the plant in robust health, so the house in which it is grown should not be artificially shaded in any way. Where it is practicable to maintain the water of a large tank at the temperature above mentioned, the Victoria may be grown in the open air in places sheltered from the wind, which has—except under such conditions—too much power on the upturned edges of the huge leaves. The illustration represents a plant in the open, surrounded by hardy subjects.

V. regia (royal).* Queen Victoria's Water Lily; Royal Water Lily; Water Maize; Water Platter. *fl.* 1ft. or more in diameter; calyx deeply quadrifid, the tube tawny, very prickly, turbinate, adnate with the ovary, the segments purple-brown, concave, deciduous, rather shorter than the petals; torus annular; petals very numerous, the outer ones white, spreading, oblong, concave, obtuse, the inner ones gradually passing into filaments and becoming deeply coloured with purple or full rose; perfect stamens in about two series, large, fleshy, subulate, gracefully incurved below, the rest erect; peduncles or scapes radical, longer than the petiole, and rising above the surface of the water when in flower, terete, prickly, sometimes 1in. in diameter, single-flowered. Summer. *fr.* a large, cyathiform, truncate, fleshy, green, prickly berry, bearing many oval, very dark brown seeds. *l.* usually floating, 4ft. to 6½ft. in diameter, at first oval with a deep, narrow cleft or sinus at one end, at last almost exactly orbicular, peltate, flat, but having a turned-up margin 2in. to 5in. broad; upper side full green, reticulated; under side deep purple, sometimes green, spongy-pubescent, copiously veined, more or less beset with sharp and horny, subulate prickles; petioles terete, radical, copiously prickly. Rhizome thick. 1838. See Fig. 172, p. 158. (B. M. 4275-4278.)

VICTORIAN DOGWOOD. *See* **Prostanthera lasianthos.**

VICTORIAN HAZEL. *See* **Pomaderris apetala.**

VICTORIPERREA. A synonym of **Freycinetia** (which *see*).

VIEUSSEUXIA. Included under **Moræa** (which *see*).

VIGIERA. A synonym of **Escallonia** (which *see*).

VIGNA (named after Dominic Vigni, Professor at Padua, who wrote a commentary on Theophrastus, in 1625). SYNS. *Callicysthus, Scytalis*. ORD. *Leguminosæ*. A genus embracing about thirty species of stove, greenhouse, or hardy, twining or prostrate herbs, inhabiting

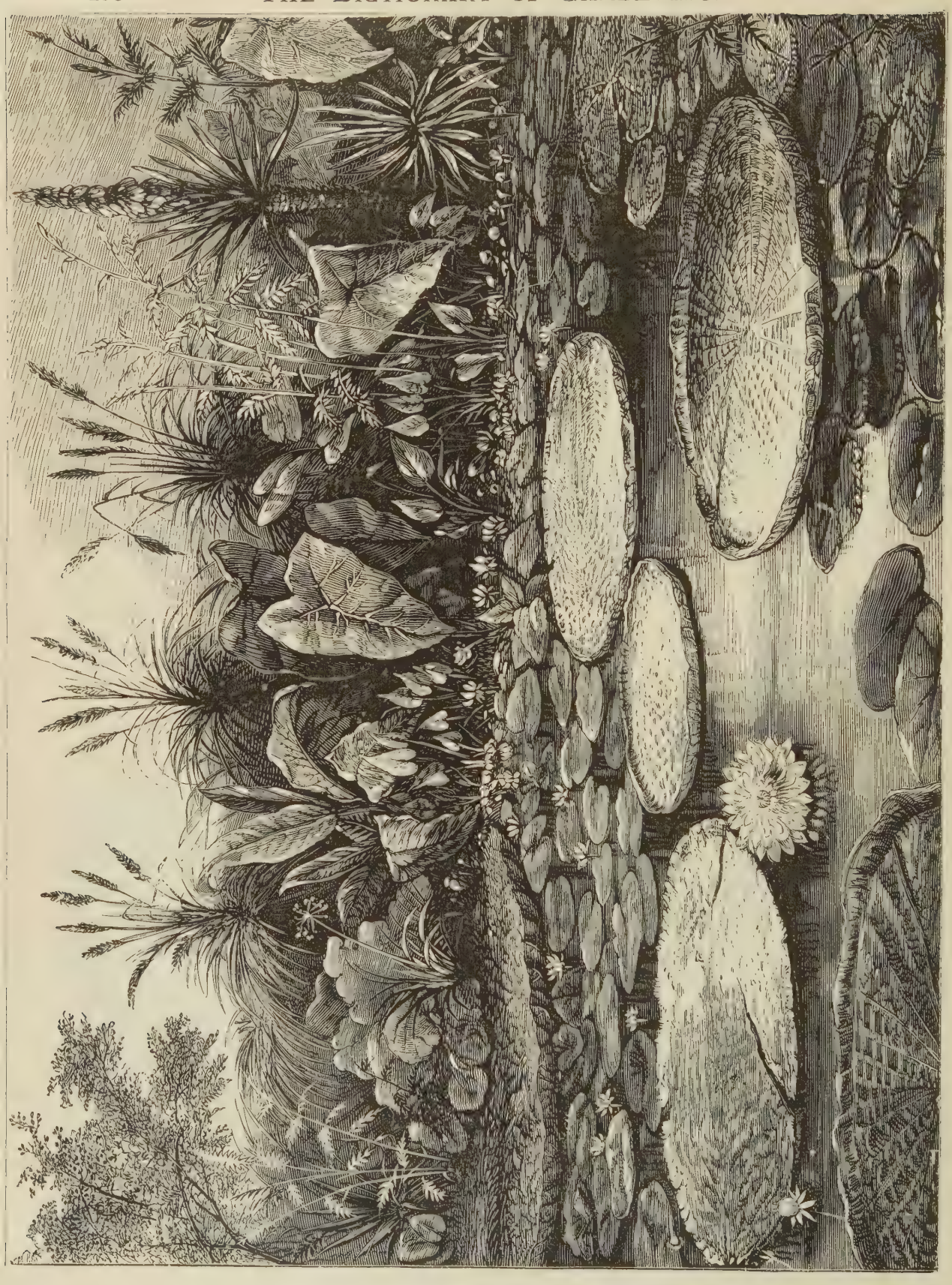

FIG. 172. VICTORIA REGIA (page 157).

Vigna—*continued.*

the warmer regions of the globe. Flowers yellowish or rarely purplish, shortly fasciculate-racemose at the apex of an axillary peduncle; two upper calyx teeth or lobes connate or distinct; corolla with two ear-like appendages; standard orbicular; wings falcate-obovate; bracts and bracteoles small, caducous. Pods linear, straight or scarcely incurved. Leaves pinnately trifoliolate, stipellate. *V. sinensis* is largely cultivated in the East; the Chinese cook and eat the pods as we do kidney beans. Seeds of the under-mentioned species may be sown in any fairly good soil.

V. Burchellii (Burchell's). *fl.* purple, on peduncles 3in. to 5in. long, umbellate; calyx deeply four-cleft; wings with an ear-shaped appendage to the claw. Summer. *l.* 1in. to 2½in. long, on petioles ¼in. to ½in. long; leaflets ovate-lanceolate or lanceolate, rigid, bristly-mucronate, glabrous. Stems woody, diffuse, the branches rigid and sub-erect. Cape of Good Hope, 1816. Greenhouse. SYN. *Otoptera Burchellii.*

V. Catiang (Catiang). *fl.* yellow or reddish; corolla twice the length of the calyx, which is less than ¼in. long; racemes few-flowered, long-peduncled. July and August. *fr.*, pods 1ft. to 2ft. long, less than ½in. broad, edible. *l.*, leaflets membranous, ovate-rhomboid, entire or slightly lobed. East Indies, &c., 1776. Hardy, low and sub-erect, or tall and twining annual. SYN. *Dolichos sinensis* (B. M. 2232). This has been grown as a vegetable in France under the name of *Phaseolus Riccardianus.*

V. glabra (glabrous). *fl.* yellow, crowded: racemes borne on stout peduncles, which are longer than the leaves. July to September. *fr.*, pods hirsute. *l.*, leaflets ovate or ovate-lanceolate. Southern United States, 1685. Nearly hardy, twining annual. SYN. *Dolichos luteolus.*

VIGNALDIA. A synonym of **Pentas** (which *see*).

VIGUIERA (named after Alexander Viguier, a bookseller, of Montpellier, who wrote a work on Poppies, in 1814). ORD *Compositæ.* A genus comprising about sixty species of greenhouse or half-hardy, erect, branched, annual or perennial herbs, rarely shrubs, inhabiting the warmer parts of America. Flower-heads mediocre, rarely large, pedunculate at the tips of the branches, heterogamous; involucre broadly campanulate or hemispherical, the bracts in three or more series; receptacle convex, conical, or at length oblong, paleaceous; achenes often more or less pilose. Lower leaves (rarely all) opposite; upper ones usually alternate. Only one species calls for mention here. For culture, *see* **Helianthus.**

V. linearis (linear-leaved). *fl.-heads* yellow; involucral scales oblong, leafy-appendiculate at apex. September. *l.* sessile, alternate, rarely opposite, linear, entire, one-nerved, revolute-margined, hispid-scabrous on the nerves. Stems erect, branched, scabrid. *h.* 2ft. Mexico, 1823. Half-hardy perennial. SYN. *Helianthus linearis* (B. R. 523).

V. rigida (rigid). A synonym of *Helianthus rigidus.*

VILFA (of Adanson). A synonym of **Agrostis** (which *see*).

VILFA (of Beauvois). A synonym of **Sporobolus** (which *see*).

VILLA GARDEN. *See* **Garden.**

VILLANOVA (named after Tomas M. Villanova, 1757-1802, Professor of Botany at Valencia). ORD. *Compositæ.* A small genus (six or seven species) of greenhouse or hardy, diffuse, glandular-pubescent herbs, inhabiting Peru, Columbia, and Mexico. Flower-heads yellow, heterogamous, pedunculate, irregularly paniculate or corymbose; involucre campanulate, with a few sub-equal bracts; receptacle small, naked; ray florets ligulate, three-toothed; disk florets five-cleft; achenes glabrous. Lower leaves (or all) opposite, the upper ones often alternate, ternately or pinnately dissected, often few-lobed. *V. chrysanthemoides*, the only species introduced, is a hardy annual. Seeds should be sown on the open border, in April.

V. chrysanthemoides (Chrysanthemum-like). *fl.-heads* 1in. in diameter; ray florets fifteen to twenty; peduncles stout, glandular, naked or with one or more imperfect leaves. September. *l.* alternate, petiolate, 2in. long and broad, twice ternately cut into linear or obovate, laciniate, recurved lobes. Stem grooved, leafy, erect. *h.* 1ft. to 2ft. Rocky Mountains, 1878. (B. M. 6422.)

VILLANOVA (of Ortega). A synonym of **Parthenium** (which *see*).

VILLARESIA (named after Matthias Villarez, a Spanish botanist, Superintendent of the Gardens at Santa Espina). SYN. *Citronella.* ORD. *Olacineæ.* A genus consisting of eight or ten species of stove, evergreen, climbing shrubs or small trees, inhabiting the tropics of both hemispheres. Flowers white; calyx five-parted; petals five, ribbed inside; stamens five; cymes small, paniculate or racemose. Leaves alternate, oblong, entire or spinulose-dentate, thickly coriaceous, clear. Only one species has been introduced. For culture, *see* **Olax.**

V. mucronata (mucronate-leaved). *fl.* fragrant, sessile; racemes terminal and in the upper axils, solitary, rarely in twos or threes, 2in. long. September and October. *l.* shortly petiolate, ovate or oblong, mucronate, highly glabrous, shining above, paler beneath, spiny-toothed in young trees, entire in adults. Trunk erect, terete. Chili. Tree.

VILLARIA. A synonym of **Berardia** (which *see*).

VILLARSIA (named in honour of Dominique Villars, 1745-1814, Professor at Grenoble; he wrote on the plants of Dauphiné). SYN. *Renealmia* (of Houttuyn). ORD. *Gentianeæ.* A genus embracing ten species of South African or Australian, marsh-loving, greenhouse herbs. Flowers yellow or white, cymose; calyx five-parted or deeply five-cleft; corolla broadly campanulate, sub-rotate, the lobes valvate; stamens five, affixed to the tube; filaments filiform. Radical leaves long-petiolate, entire or irregularly sinuate-toothed. Stems simple and leafless, or slightly branched and furnished with a few leaves. The following species are known to cultivation, and form elegant subjects when in blossom. Peat and sand form the most suitable compost, and the pots in which the plants are grown should be placed in water. Propagation may be readily effected by divisions, or by seeds.

V. capitata (headed). *fl.* yellow, sessile, in compact, globular or depressed heads about ½in. in diameter, on long peduncles. Summer. *l.* long-petiolate, broadly ovate, orbicular, or reniform, coarsely sinuate-toothed or entire, under 1in. long. Stems slightly branched, leafy, 6in. high. Australia, 1879. (B. M. 6420.)

V. Crista-galli (cock's comb). A synonym of *Menyanthes Crista-galli.*

V. Humboldtiana (Humboldt's). A garden name for a form of *Limnanthemum indicum.*

V. nymphæoides (Nymphæa-like). A synonym of *Limnanthemum nymphæoides.*

V. ovata (ovate-leaved). *fl.* citron-yellow; corolla segments crenate-fimbriate on the margins, pilose at the base within; cymes terminal, raceme-like. June. *l.* clustered, coriaceous, oval, entire. Stems ascending, nearly naked. *h.* 6in. Cape of Good Hope, 1786. SYN. *Menyanthes ovata* (B. M. 1909).

V. parnassifolia (Grass of Parnassus-leaved).* *fl.* yellow; corolla lobes shortly exceeding the calyx. August. *l.* long-petiolate, ovate or almost orbicular, entire or sinuate-crenate, slightly cordate or rounded at base, mostly under 1in. long. Flowering stems 1ft. to 2ft. high, loosely paniculate, leafless except small bracts, or a solitary leaf at the first branching. Australia, 1825. (B. R. 1533, under name of *V. reniformis.*)

V. reniformis (kidney-shaped).* *fl.* yellow; corolla spreading, ⅔in. to 1in. in diameter, the lobes copiously bearded or fringed inside at base. July. *l.* in a dense tuft, on long petioles, ovate to orbicular or reniform, more or less cordate at base, entire or slightly sinuate-toothed, mostly 1in. to 2in. long. Flowering stems as in *V. parnassifolia.* *h.* 6in. to 3ft. Australia, 1820. SYN. *Menyanthes exaltata* (B. M. 1029). The plant figured in B. M. 1328 as *Menyanthes sarmentosa* is only a stoloniferous form of this species.

VILLOSE, VILLOUS. Shaggy; covered with long and soft (not interwoven) hairs or villi.

VILMORINIA (named after Pierre Louis Vilmorin, a French cultivator, who wrote on leguminous plants in 1825). ORD. *Leguminosæ.* A genus containing three species of erect, stove shrubs, natives of San Domingo, requiring similar culture to that recommended for **Clitoria.** The only species introduced is described below; it is probably no longer in cultivation.

V. multiflora (many-flowered). Vilmorin's Purple Pea-flower. *fl.* purple, in axillary racemes; calyx cylindrical, obtusely four-toothed, sub-bilabiate; petals narrow-oblong, the wings shorter than the keel. May. *l.* imparipinnate; leaflets five or six-jugate, oval, pubescent beneath; stipules rather broad at base, long-subulate. *h.* 6ft. 1826. SYN. *Clitoria multiflora.*

VIMINARIA (from *vimen*, a twig; alluding to the twiggy, leafless branches). Rush Broom. ORD. *Leguminosæ*. A monotypic genus. The species is a greenhouse shrub, with Rush-like stems. It thrives in a mixture of loam and peat. Propagation may be effected by cuttings of half-ripened shoots, inserted in sand, under a bell glass, in April; or by seeds, sown on a gentle hotbed.

V. denudata (naked). Australian Rush Broom; Victorian Swamp Oak. *fl.* orange-yellow, small, in long, terminal racemes; calyx teeth short, equal; petals on rather long claws; wings shorter than the standard; stamens free. August. *l.* alternate, mostly reduced to filiform petioles 3in. to 9in. long, the lower ones on luxuriant specimens occasionally bearing at the extremity one to three oval-oblong or lanceolate, herbaceous leaflets, ½in. to 1½in. long. *h.* 10ft. to 20ft. (or sometimes low and decumbent). Australia, 1780. (B. M. 1190; P. M. B. xiv. 123.)

VIMINEOUS. Having long, flexible twigs or shoots; *e.g.*, many Osiers.

VINCA (*Vinca*, or *Pervinca*, was the old Latin name used by Pliny). Periwinkle. Including *Catharanthus*. ORD. *Apocynaceæ*. A genus comprising ten broadly-distributed species of pretty, stove, greenhouse, or hardy, erect, or procumbent herbs or sub-shrubs. Flowers rather large, axillary, solitary; calyx five-parted, without glands, the lobes narrow; corolla salver-shaped, the tube cylindrical, the five lobes ample; stamens above the middle of the tube, included. Leaves opposite. The best-known species are here described. *V. rosea*, which requires stove or greenhouse treatment, may readily be propagated from cuttings of young shoots, taken off soon after new growth is commenced in spring, and inserted in sandy loam, in a close frame. The points should be taken out as the young plants become established, to make them bushy; the flowers are borne on the new shoots as they lengthen. A compost of fibrous loam and a little decayed manure intermixed is well suited to the requirements of this species. It is not necessary to propagate every year, except for increasing stock: the old plants can be kept through the winter. The hardy Vincas are excellent trailing plants for furnishing banks, rockwork, rooteries, &c., in wild gardens, pleasure-grounds, and woods. They grow in almost any kind of soil, and spread rapidly when once established. Propagated by division: any of the single pieces with roots attached may be dibbled in from autumn until early spring.

V. acutiflora (acute-flowered).* A synonym of *V. media*.

V. herbacea (herbaceous). *fl.* purplish-blue; corolla eight to eleven lines long, bearded in the middle and at the throat. June and July. *l.* elliptic or lanceolate, somewhat obtuse, 1in. long, the margins revolute and slightly ciliated. Stems all fertile, herbaceous, glabrous, declinate, simple. Eastern Europe, 1816. Hardy. (B. M. 2002; B. R. 301.)

FIG. 173. FLOWER OF VINCA MAJOR.

V. major (greater).* Band-plant; Cut-finger. *fl.* blue-purple; calyx lobes ciliated, equalling the corolla tube. April and May. *l.* ovate, or cordate at base, ciliated. Flowerless stems rooting at the tip only; fertile ones erect in flower, elongated afterwards. Europe (Britain), &c. Larger in all its parts than *V. minor*. See Fig. 173. (Sy. En. B. 905.)

V. m. elegantissima (very elegant).* A form with foliage beautifully margined or blotched with creamy-white.

V. media (intermediate). *fl.* blue; corolla 1in. long, the lobes obliquely ovate, acuminate. August. *l.* ovate, narrowed at both ends, highly glabrous, 1in. to 2in. long, ½in. to ¾in. broad. Sterile stems reclinate; fertile ones nearly erect, 1ft. or more high. Mediterranean region. Hardy perennial. SYN. *V. acutiflora*.

Vinca—*continued.*

V. minor (lesser).* *fl.* 1in. in diameter; calyx lobes glabrous, one-third the length of the corolla tube; corolla blue-purple. April and May. *l.* 1in. to 1½in. long, elliptic-ovate, with glabrous margins, on very short petioles. Stems tough; flowerless ones 1ft. to 2ft. long, prostrate, rooting; flowering ones short, erect. Europe (Britain), &c. (F. D. 1613; Sy. En. B. 906.) Of this pretty plant there are a variegated form, a white-flowered variety, and others with double white and double blue flowers.

FIG. 174. VINCA ROSEA, showing Habit and detached Flowering Branchlet.

V. rosea (rosy).* Madagascar Periwinkle; Old Maid. *fl.* almost sessile; corolla tube 1in. long; throat with a hairy ring over the tips of the stamens, and a slighter one at the narrow orifice; lobes white, with a pink eye, sometimes all rose-coloured or white, showy, obovate. March to October. *l.* long, on short petioles. South Florida, Tropics, 1758. Plant low, erect, puberulent. Greenhouse or stove. See Fig. 174. (B. M. 248.)

VINCETOXICUM (from *vincere*, to conquer, and *toxicum*, poison; in allusion to supposed antidotal powers). ORD. *Asclepiadeæ*. A genus comprising about seventy species of stove, greenhouse, or hardy, erect or twining, perennial herbs or sub-shrubs, inhabiting temperate and warm regions, but rarer in the tropics. Flowers usually greenish-yellow or purplish, sometimes nearly black, in variable cymes; calyx five-parted; corolla somewhat rotate-campanulate, deeply five-cleft; corona affixed to the staminal tube, sub-entire, toothed, shortly five to ten-lobed or nearly five-parted. Leaves opposite or rarely quaternately whorled or alternate. The better-known species are here described. All (except *V. pilosum*) are hardy perennials. They were formerly classified under **Cynanchum** (which *see* for culture).

V. acutum (acute). *fl.* white; petals oblong, obtuse. July. *l.* oblong, ovate-cordate, acute. South Europe, 1596. Twiner.

V. fuscatum (brown-flowered). *fl.* yellow; corolla bearded; umbels simple. July. *l.* ovate. Stems twining at top. *h.* 2ft. to 3ft. South-east Europe, 1817. SYN. *Cynanchum minus*.

V. japonicum (Japanese). *fl.* whitish, on slender pedicels; corolla segments glabrous; cymes shorter than the leaves, loose-flowered. Summer. *l.* rounded, shortly acuminate or retuse, very shortly mucronate, paler beneath, the veins softly puberulous and somewhat velvety. Japan. Plant somewhat twining above. (L. & P. F. G. iii., p. 150.)

V. medium (intermediate). *fl.* white; corolla beardless; pedicels hardly longer than the peduncle; umbels often divided. May. *l.* broadly ovate, obtuse, or ovate-lanceolate, acute. Stems twining at tops. *h.* 2ft. to 3ft. Eastern Europe, &c.

V. nigrum (black). *fl.* brown; corolla bearded; pedicels hardly longer than the peduncles; umbels simple. July. *l.* ovate-lanceolate, acuminate, finely ciliated on the edges, narrower than those of the next species. Stems twining at top. *h.* 2ft. to 3ft. South Europe, 1596. SYN. *Cynanchum nigrum* (B. M. 2390).

V. officinale (officinal). Tame Poison. *fl.* white; corolla beardless; pedicels three times longer than the peduncle; umbels simple. May. *l.* ovate, acuminate, finely ciliated on the edges when young. Stems erect, furnished with a downy line on each side. *h.* 1ft. to 3ft. Europe, 1596. SYN. *Cynanchum Vincetoxicum*.

V. pilosum (pilose). *fl.* white, on short, erect pedicels; peduncles nearly equalling the leaves, many-flowered. July. *l.* ovate,

Vincetoxicum—*continued.*

rounded and mucronulate at apex, rounded or sub-cordate at base. Cape of Good Hope, 1726. Greenhouse, twining sub-shrub. SYN. *Cynanchum pilosum* (B. R. 111).

V. purpurascens (purplish). *fl.* dull purple, on slender pedicels; cymes long-stalked, many-flowered, proceeding from the axils of the upper leaves. *l.* narrow-oblong, mucronate, becoming smaller near the ends of the shoots where the flowers appear. Stems and all the green parts slightly downy; when in flower, becoming weaker, with a tendency to twine. Japan, 1850. Half-hardy or hardy perennial.

FIG. 175. LEAVES AND FRUITS OF THE WILD VINE (VITIS VINIFERA).

VINE (*Vitis vinifera*). The Grape Vine is found growing wild in the temperate regions of Western Asia, Southern Europe, and parts of Northern Africa, and is generally believed to be a native of that part of Asia Minor to the south of the Caucasus and of the

Vine—*continued.*

Caspian Sea. According to De Candolle, in "L'Origine des Plantes Cultivées," it grows there "with the luxuriant wildness of a tropical creeper, clinging to tall trees, and producing abundant fruit without pruning or cultivation (see Fig. 175). . . Its dissemination by birds and other agencies must have begun very early—perhaps before the existence of man in Europe, or even in Asia. . . . Seeds of the Grape Vine have been found in the lake dwellings of Castione, near Parma, which date from the age of bronze . . . and Vine leaves have been found in the tufa round Montpellier—probably deposited before the historical epoch." Records of the cultivation of the Grape, and of the making of wine, in Egypt, go back 5,000 to 6,000 years.

The introduction of the Vine into this country is generally credited to the Romans, in the reign of the Emperor Augustus, about A.D. 10. Vineyards existed in England at a very early period of our history. They are mentioned in the "Domesday Book," and also by Bede, who wrote in A.D. 731. The Isle of Ely was called the Isle of Vines by the Normans, the Bishop of Ely, shortly after the Conquest, receiving as tithes wine made from the Vines grown in his diocese. In the reign of Henry III. we read of vineyards. Malmesbury mentions the county of Gloucester as being, in his time, very rich in vineyards; and there still remain traces of them at Tortworth. The first Earl of Salisbury planted a vineyard at Hatfield, which is noted as being in existence when Charles I. was taken there as a prisoner. There are records of vineyards existing in various parts of Surrey, and a notable one, which is still partly in existence, once flourished at Bury St. Edmunds. Vineyards seem to have been common to all monastic establishments; but the suppression of the latter, and, subsequently, the fact of cheap foreign wines becoming more easily accessible, led, no doubt, to neglect in Grape cultivation.

Of noteworthy Grape Vines, Speechly, who wrote on the Vine at the end of the last century, mentions one thatw as growing in the open air at Northallerton, in Yorkshire, in 1789, that had covered a space of 132 square yards, and was supposed to have been planted 150 years. During the last century, the cultivation of Grapes seems to have become pretty general; several notable examples being still in existence—as that of the Black Hamburgh Vine at Valentines, Ilford, in Essex, which Gilpin, in his "Forest Scenery,"

Vine—*continued.*

says was planted in 1758. This is stated to be the oldest Vine in England, and to be the parent of the still more celebrated Vine at Hampton Court, which was planted in 1769, and now covers a space of about 220 square yards. Of more modern Vines, the most remarkable examples are those at Cumberland Lodge, Windsor, which annually produce about 2,000lb. weight of Grapes; that at Mr. Kay's, Finchley, covering a house 89ft. long by 18ft. wide; and that at Manresa Lodge, Roehampton, filling a house 224ft. long, the stems extending to 1,365ft.

The Grape Vines of Europe are all varieties of *Vitis vinifera*; whilst those of America belong to *V. Labrusca.*

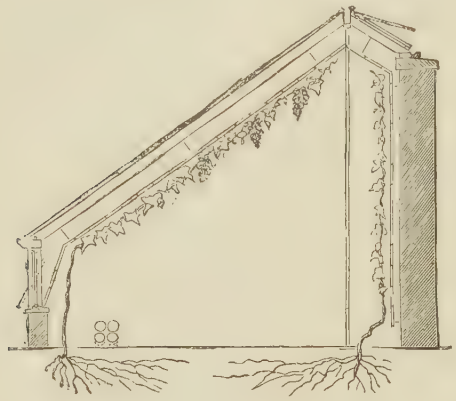

FIG. 176. SECTION OF HIP-ROOFED VINERY.

VINERIES. In regard to these, Vines, it may be remarked, are extremely accommodating, and will grow in any structure sufficiently exposed to the influence of light and air—an essential point. For certain purposes, however, it has been found that some forms are more suitable than others. Thus, for the growth of very early grapes, lean-to houses (see Fig. 181) are most approved. They are naturally warmer, the back wall affording considerable shelter, and require less fixing, &c. For general purposes, the three-quarter span or hip-roofed vinery (see Fig. 176) is much approved, combining the merits of the lean-to, facing the South, with those of the span-roof, generally erected facing East and West. The commonest form, and that most generally erected by the

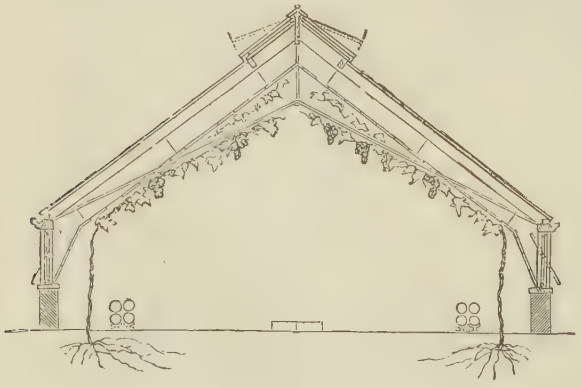

FIG. 177. SECTION OF SPAN-ROOFED VINERY.

growers for market, is the span-roof (see Fig. 177). Vineries may be of any size that circumstances allow for

Vine—*continued.*

general cropping, but for early grapes, where much fire-heat is required, as well as for keeping late grapes, moderate-sized houses are desirable; and low houses are to be preferred to high ones for general utility and working purposes.

Heating. All structures for the growth of grapes should be efficiently warmed. Artificial heat, in distinction from solar heat, may be supplied either by flues or by hot-water piping. Flues are objectionable on account of the great amount of space they occupy, and the very arid heat they supply, favouring the intrusion of Red Spider, &c. Hot-water is the system now generally adopted. The amount of piping must be regulated by the special requirements in each case. An ample supply is preferable at all times, so as to avoid keeping the pipes at a high temperature, which is injurious.

Ground Vineries. The Vine may be grown in a very circumscribed space, and under very diverse conditions. The cottager with his single rod of ground may, by aid of "old Father Sol" and a few squares of glass, supplemented by care and attention, produce his own grapes nearly equal in quality to those of his lordly neighbour, with his costly vineries and gardening skill. Thanks to the introduction of cheap glass, and the examples of such worthy men as the late Mr. Thomas Rivers, Mr. Wells, Dr. Newington, and Mr. Harrison Weir, the success of ground vineries has been thoroughly established.

The magnificent examples of grapes grown in ground vineries by Mr. Weir, consisting of such varieties as Black Hamburgh, Muscat Hamburgh, Muscat of Alexandria, and especially of Muscat Champion, all of which have been exhibited to the Fruit Committee of the Royal Horticultural

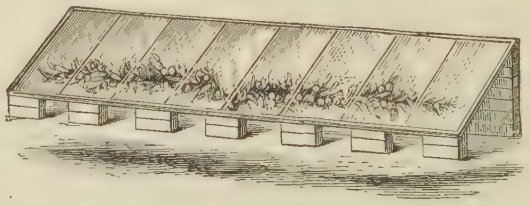

FIG. 178. GROUND VINERY.

Society, proved to be of very superior quality. Fig. 178 represents an extremely simple contrivance. A few plain bricks (or boards) form the back, some 2ft. to 3ft. high, and a simple wall-plate in front, on which the squares of glass are loosely placed, rests on couples of bricks. The structures, however, may be of almost any form, provided the Vine in its growth be thoroughly exposed to the direct influence of the sun's rays. Mr. Harrison Weir prefers a span-roofed structure, 7ft. in length, 2ft. 8in. wide, the sloping sides each 2ft. 8in. deep, and the height in centre, from ground line to ventilator, 1ft. 10in. The ends are of wood, with an air-hole for ventilation, fitted so as to be closed when required. A warm, dry soil, and an open, sunny situation, are of the greatest importance: there would be very little hope of success in a low-lying, cold situation.

The Vines should be planted inside the vinery, and trained along the top to a wire or pole going its whole length, and hung somewhat from it, so that the string or fastening may not be tight. The lights should never be taken off, either in summer or winter, for a permanence, or even left off for a single night, unless the weather be very hot, or for the purpose of ripening the wood. The bunches of fruit should be thinned in the usual way, and not so many left as to retard the ripening.

Vine—*continued.*

Varieties. Nearly all the cool-house Vines, such as Black Hamburgh, Buckland Sweetwater, Foster's Seedling, Madresfield Court, Muscat Champion, Royal Muscadine, and most of the small Chasselas and Frontignans, may be grown in this way, and, in most instances, with great success.

PROPAGATION. The propagation of the Vine, as generally practised in this country, is effected by "eyes." By this term is meant the buds on the ripened shoots of the

FIG. 179. VINE EYE.

previous season's growth, as represented by Fig. 179. These are cut as shown, about 1in. or more in length, the best-matured wood, having firm, plump buds, or "eyes," being selected. The season best adapted for the operation is during the months of January and February—the earlier the better, so that the plants may have plenty of time to

FIG. 180. VINE EYE STARTED.

grow. A number of small pots or pans should be prepared, and filled with fine soil. A single eye should be inserted in the middle of each small pot, and pressed down until the top of the bud is just level with the surface of the

Vine—*continued.*

soil: in the pans, a number of eyes may be inserted in the same manner, to be potted off singly afterwards. The pots and pans, when filled, should be plunged in a bed having a bottom-heat of about 80deg., and a top temperature of from 65deg. to 70deg., and afterwards gently watered. Many other methods of "putting in" the eyes may be adopted. Great care is required when the buds commence to grow (see Fig. 180), they being extremely liable to "damp off" at this period. As soon as the roots have reached the sides of the pots, the plants should be transferred to larger ones, and plunged in the hotbed, to be repotted again, and so on. Vines may also be layered. This consists in taking a young shoot of a Vine, and pegging it down to the surface of the ground, or on pots; roots are freely produced, every bud becoming a separate plant when severed. In Vine-growing countries the plants are propagated by cuttings—*i.e.*, shoots cut into lengths of from 10in. to 18in., which are frequently planted in their permanent positions at once. Budding and inarching are also practised in various ways. Grafting the Vine is largely adopted where it is desired to introduce new varieties without complete renewal of the plants. The grafting of Vines differs somewhat from that of ordinary grafting—not in the mechanical operation itself, which is practically the same, but owing to the extraordinary flow of sap which occurs in the Grape Vine at the commencement of growth in spring; if any portion of the stem be cut at that time, a very large outpouring of watery fluid takes place, termed "bleeding," which prevents union. It is necessary to defer the operation until this flow ceases, which will be when the first few leaves have become properly expanded. Common whip-grafting is the simplest and best method to adopt. At whatever part of the stock it may be determined to affix the scion, it is necessary to leave a growing shoot and some leaves above this point, for the purpose of drawing off by evaporation the superabundant water that will have to be disposed of, and likewise for forming and perhaps drawing up nourishment for the supply of the scion itself until a union is effected. The scions being affixed, they should be tied securely, and covered with some sort of grafting wax in preference to either clay or moss. *See also* remarks under POT CULTURE.

CULTIVATION UNDER GLASS. The Grape Vine is a remarkably free-growing plant, and naturally requires a great amount of nourishment in the matter of soil, manure, and water, for its successful cultivation. Vine borders require to be constructed with some degree of care. Low-lying situations, with damp, cold subsoils, should be avoided; ample drainage is most essential. The best situation for a Vine border is on a gentle slope, where the ground is drained naturally. In such a situation, if on a gravelly subsoil, little artificial drainage is required. It is well, however, when forming a border, to put in from 1ft. to 1½ft. of broken bricks, &c., as drainage; and in many cases it is expedient to concrete the bottom below this, so as to prevent any possibility of the roots descending. As to the sizes of the border, the roots of Vines travel (if allowed) a great way, and it is necessary to restrict their passage. An ordinary-sized border should correspond to the width of the house; thus, a vinery 16ft. wide may have a border 16ft. wide, and so on. A good practice is to form the border both inside and outside, the front wall being built on arches, so as to allow the roots to go either way (see Fig. 181). The depth of a Vine border should range from 2ft. to 3ft., and need never exceed the latter figure.

Soil. The soil best suited for Vines is a fibry, calcareous, yellow loam—that is, the top spit, or turf cut 3in. to 4in. thick, from some old pasture land. This may vary greatly, from light, sandy loam to that of a clayey nature. Chop the turfs roughly in pieces, and to five or six cubic yards add one yard of old lime

Vine—*continued.*

rubbish or broken bricks, a small portion of charcoal, wood ashes, or burnt soil, and about 2cwt. of ½in. ground bones. These ingredients, well mixed, will constitute the main body of the soil to be used, modified in proportions according to the character of the loam. If the loam used

Vine—*continued.*

the soil, but also for the prevention of evaporation, whereby a greater and more constant degree of humidity may be maintained. Covering Vine borders, excepting where very early grapes are required, is unnecessary. Watering is one of the most important operations; perhaps more Vines are ruined through want of water than from any other cause. During the growing season, Vines can scarcely receive an over-supply. Inside borders require special care and attention in this respect, as they receive no benefit from the rains, and are directly and entirely under the control of the cultivator. When the fruit is ripe, a somewhat drier condition should be maintained, but it is not desirable to allow the soil to become very dry even then.

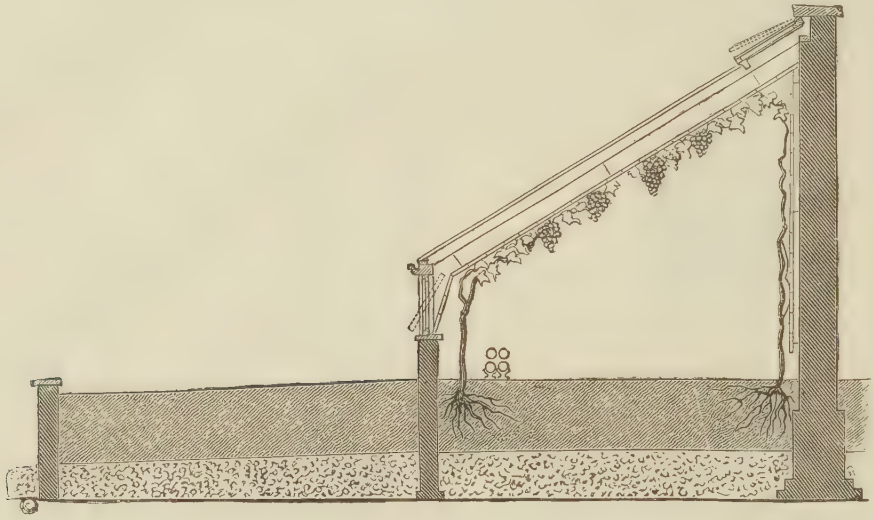

FIG. 181. SECTION OF LEAN-TO VINERY AND OF VINE BORDER.

be of a sandy nature, less of the lime rubbish will be required, as the main object in using this is to give porosity to the soil. The top-dressing of Vine borders is of great importance, and should be attended to every season; the greater the quantity of fresh soil that can be given, the better, especially after the Vines have got into heavy croppings. The soil used for this may be of a somewhat richer character than that recommended for the formation of the border. As much of the old soil should be taken away as can be afforded, and new soil added; or, if the soil cannot be removed, a dressing of some kind of manure should be given, and lightly forked into the border before the Vines commence to grow, in spring.

Manures. For the growth of Vines nearly all soils require the addition of some fertilising ingredients—some kind of manure. Farmyard manure is frequently used; but, as this rapidly decays, its influence is soon exhausted: it can only be recommended for mulching or top-dressing. Bones, as containing phosphate of lime, constitute one of the best manurial ingredients for mixing with the soil; being slow to decay, they continue to afford sustenance for many years. Large, unbroken bones are next to useless. Bone-meal, dissolved bones, and horn-shavings are all valuable ingredients of a similar character presented in a more readily available form, and, consequently, more immediately effective. Potash manures are of special value to Vines: a mixture of ½cwt. of superphosphate to 1cwt. of nitrate of potash, applied at the rate of 1lb. to the square yard, has been found highly beneficial. A very excellent prepared, or what is termed "artificial," manure, now largely used, is Thomson's Vine Manure. Mulching is very necessary in hot, dry seasons, not only as a means of enrichment to

Planting. Vines may be planted at any season of the year, provided all the requisite conditions be fulfilled. October is a very good period, the soil then being generally in good condition: the roots commence to grow a little, and get, to some extent, established before spring. January and February are another good season. In planting ripened Vines, care should be taken to shake out all the soil from the roots, and to spread these fully out as near to the surface as possible. Another method

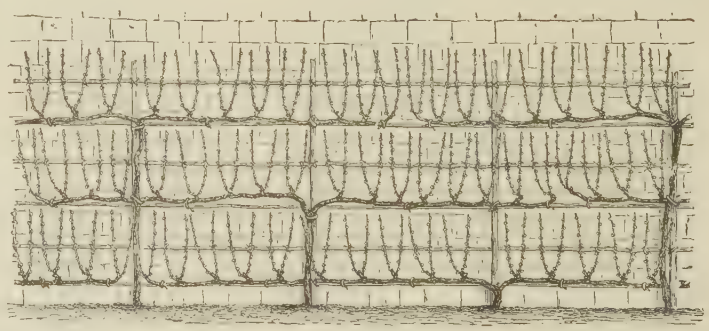

FIG. 182. WALL-TRAINING OF VINES.

Vine—*continued.*

is that of planting the young growing Vines that have been raised from eyes during the same season; this would take place in May, June, or July. These Vines, if properly attended to in regard to heat and moisture, make the very best of plants. As to the distances apart at which Vines should be planted, this almost entirely depends on the style of training to be adopted. They should never be less than 4ft., to allow the side shoots to develop; in many cases, 5ft. is preferable.

Pruning and Training. The Vine is a free-growing, long-lived plant. In its natural state it is of a climbing character, sustaining itself by its tendrils, so that in its cultivated condition it has to be supported in some way. Of the various methods adopted in the training of the Vine, three call for notice here: (1) That practised in the vineyards or wine-growing countries; the young or fruit-bearing shoots are tied to upright poles, 6ft. to 8ft. in height, the plants being about the same distance apart. In other cases they are sometimes pruned into the form of candelabra or other fancy shapes. (2) That adopted for Vines against walls, as practised at Thomery (see Fig. 182). (3) In this country, the Grape Vine is generally trained, in vineries, to trellises fixed at a certain distance from the glass or roof of the house, and is pruned either on what is termed the Spur system, or on that known as the Long Rod system, each of which is subject to all sorts of modifications according to fancy or convenience. The Spur System is that most practised, and may be briefly described thus: The Vines being planted at the proper distances apart, the young plants are cut down to some three or four eyes from the ground; one shoot is trained up in the first season, forming the main stem of the Vine. During the winter season following, this stem is cut back to some 5ft. or 6ft. in length, according to its strength. In the second year, the buds on this stem form shoots on which the fruit is borne, and which are stopped at one or two leaves beyond the bunches, or at a length of 16in. or 18in., the main stem being allowed to extend as before. In pruning, the next winter, these side shoots are cut back to one or two buds, which, being left, form what is termed a "spur" (see Fig. 183), the main stem being pruned back to 5ft. or 6ft. as before. In the third year, one or more shoots are produced from each spur, one of which is selected, trained and stopped as before, and again pruned in winter to one or more eyes; and so on from year to year—in most cases, the Vines filling their allotted space in five or six years. The Long Rod system consists in leaving a number of young shoots or rods to form the bearing shoots, and it is more suitable for some varieties than the Spur system. Vines may be trained to any number of stems or rods, and extended as circumstances may permit, the pruning otherwise being similar.

Disbudding. The first operation that requires to be performed each succeeding year, on the commencement of the growth of the Vine, and to which attention must be early directed, is that which is termed disbudding, but which is, in reality, a thinning-out and regulating of the young shoots. This is an operation of very great importance in respect to young Vines, as upon its being properly performed will depend the future form or character of the plant. Disbudding is, in fact, the first step in training, although it is practised much in the same manner long after the form of the Vine is established. The time for disbudding is as soon as it may be perceived that there are more buds than are requisite —say, when the shoots are an inch or so in length; but the sooner it is done, the better. To allow the superfluous buds to develop into shoots, and then to break them off, is a waste of the energies of the plant.

Vine—*continued.*

In disbudding a young Vine, or a leading shoot of the previous year's growth, the first care should be for the top or leading bud, the growth from which should be carefully tied in and preserved from injury, as forming a continuation of the stem. In the disbudding of a young Vine, we also regulate the number of shoots which form the future spurs. To allow space for the full development of the foliage, these side-shoots should not be less than 18in. or 20in. apart. It frequently happens, especially in the case of slowly-grown Vines, that the buds on the stem are more numerous than the shoots required, and in such cases all superfluous buds must be removed—

FIG. 183. YOUNG VINE STEM—PORTION OF SECOND SEASON'S GROWTH.

A, Properly-pruned Spur. B, Improperly-pruned Spur—*ab*, line showing where Cut should have been made.

"rubbed off," as the phrase is. Nothing is more pernicious in Vine culture than the crowding of the shoots and leaves. It is well, therefore, to make a fair beginning, with the proper number, and this is done by disbudding.

Disbudding, also, at times, takes the place of pruning. If the lower buds of a young Vine-rod do not break

Vine—*continued.*

well, it is a good plan to rub off the higher or top buds, which will induce the lower ones to break stronger. Again, if it has been forgotten to prune a Vine or shoot until it has become too late to do so, on account of the risk of bleeding, the neglect may, to some extent, be rectified by a careful rubbing-off of the buds, as soon as they may appear, to the point to which the shoot ought to have been pruned; and then, when the leaves are about fully developed, the sap of the Vine will be sufficiently diverted, and the shoot may be pruned with safety.

Stopping the Shoots. This is requisite in order to keep the growth within certain limits, and thus to prevent overcrowding and confusion. According to the Spur system, the main stems being from 4ft. to 5ft. apart, the side shoots, on which the fruit is borne, cannot be allowed to extend to more than 2½ft. in length, otherwise they must overlap each other. The length of the shoots is generally regulated by the position of the bunch, the usual practice being to stop them at two joints beyond the bunch, or at one point beyond, if there is not space for a greater extension. Practically, the longer these shoots can be allowed to grow, the better, as the greater the quantity of fully-developed first leaves, the greater the amount of vigour induced. The operation itself should be performed as soon as the shoot attains the requisite length, and is done simply by pinching off the tip, between the finger and thumb, before it has become fully developed. There is thus scarcely anything to take off, no denuding of the Vine of a portion of its foliage, and no consequent check to its growth. It is a very bad practice indeed to allow the shoots to grow to such a length as to render it necessary to use the knife in stopping them. The tendril forming a part of the bunch of fruit should be pinched off at the same time, also all superfluous bunches.

After this first pinching or stopping, the foremost buds in the axils of the leaves again produce shoots, according to their vigour, which are called laterals, or summer lateral shoots. They should be stopped in the same way immediately beyond the first leaf, and so on again and again throughout the season, as they may continue to grow.

The leading shoot of a young Vine is, of course, to be exempted from this stopping, excepting in so far as relates to the laterals it produces; and these, if space is limited, must be stopped in the manner explained, or they may be trained out in the same way as the proper shoots, and allowed to extend and occupy as much space as may be available. It should always be borne in mind that the greater the quantity of fully-developed leaves and shoots, the more powerful must be the root action, and the more vigorous the plant. The stopping of the shoots of a Vine is not a checking or repressing of its vigour, but rather a guiding or directing of its energies into certain channels of a more desirable and beneficial character than those they would follow if left to themselves.

Setting or Fertilisation of the Fruit. If the flowers are not properly fertilised, they will probably fall off, or, perhaps, small berries may be formed; but, as no seed can be produced by reason of non-fertilisation, they, as a consequence, will not grow to their proper size. The impregnating process, in a mechanical point of view, consists of the application of the pollen to the stigma of the flower. It is effected at a very early stage, the little jerk occasioned by the dislodgment of the "cap" or covering causing the pollen-dust to be dispersed. This is generally effected naturally, or without any assistance beyond the maintenance of the proper temperature, atmospheric conditions, &c., and these, of course, vary according to circumstances.

Some cultivators consider it necessary to maintain a very high temperature—from 65deg. to 70deg. by night—

Vine—*continued.*

for the setting of their grapes. This, even if desirable for the forcing-on of the grapes, is not required for the mere "setting" of the fruit. For example, in late houses, and on open walls, the Vines set their fruit quite freely at a lower temperature. Grapes frequently set well at as low a temperature as 45deg. by night. Temperature ranging from 55deg. to 60deg. by night is quite high enough for the mere purpose of setting the fruit, provided there be the desired rise during the day. The setting process takes place in the early morning and forenoon. The temperature by day should always be high by sun-heat. The one great requirement is sunshine, with a fine, mild, bracing atmosphere, so that fresh air in abundance may be admitted to the houses. It is the bracing air, supplemented by the action of sun-heat, which induces the dispersion of the pollen, and by this means effects the setting of the berries.

At times, when sunshine is wanting, it is well to apply artificial assistance, such as "setting" the flowers with foreign pollen, by the aid of a camel-hair pencil. The smallest portion of pollen applied to the stigma will be sufficient; or the plan of smartly tapping the stems of the Vines, so as to shake the bunches, may be adopted, when the pollen will be seen to fly off like a cloud of dust; or, again, recourse may be had to drawing the hand gently over the bunch. The last plan is frequently practised with success amongst the "shy setters."

Certain varieties of Grapes, it is well known, set their fruit freely at all times, and under all sorts of conditions that may be favourable for the Vine. Other varieties do not set freely, whatever may be the reason, and are, in consequence, termed "bad setters." Many and varied conjectures and ideas have been submitted from time to time as to the probable cause of this defect. The pollen and the stigma in some varieties do not ripen at the same time, so that fertilisation cannot take place, and the action of foreign pollen becomes necessary. In other cases the pollen is found to be inert; and some varieties—notably, Black Morocco—have the point of the stigma exceedingly moist, which seems to prevent fertilisation, although this is a condition generally supposed to be favourable for the reception of the pollen.

Attention has also recently been directed to the fact that certain shy-setting Grapes—*e.g.*, Alnwick Seedling, Chaouch, and some American sorts — have the stamens deflexed, or falling away from the stigma, so that they cannot readily be fertilised (the ordinary Vine flower has the stamens erect, and pressing round the stigma). In such cases, the defect of non-setting being due to a structural or constitutional peculiarity, artificial impregnation is the only remedy to adopt.

Thinning the Fruit. The Vine is an extremely fruitful plant; so much so, that were the whole crop of the bunches produced by it allowed to remain, the plant would soon succumb through over-fertility. It is impossible to state how many bunches, or what crop, a Vine should carry, so much depends upon its health and constitution, on its surroundings, and on the subsequent management accorded it. A rule something like this might be laid down: According to the surface of properly-developed leaves, &c., so should be the crop of fruit taken. We know we must have so many good leaves for every pound of fruit. The greater the amount of properly-developed foliage allowed, the better. If we bear in mind that all the colouring and sweetening matter, which goes to the perfecting of the berries, has first to pass through and be elaborated by the leaves, we shall see that without a certain amount of healthy leaf-surface good fruit cannot be produced. A Vine with weak, sickly foliage cannot produce or bear much fruit, and a plant whose foliage gets destroyed by Red Spider, &c., is in exactly the same condition.

Vine—*continued.*

One bunch on each spur would be considered a heavy crop; an average of 1lb. to every foot of rod is about the general quantity left, and is considered an ordinary crop. In thinning the bunches of such free varieties as the Black Hamburgh, every second bunch on each spur should be cut off before the flowers open, and all others which it is desirable to remove as soon as the grapes are set. The thinning of the bunches, as well as of the berries, should be done early. It is a great waste of power to allow that to develop itself which is not required, and which it is known must be cut away; therefore, as soon as the berries are fairly set, thin out—that is, cut off—the supernumerary bunches at once, and commence the thinning of the berries.

The thinning of the berries—or grape-thinning, as it popularly called—is a delicate and somewhat tedious operation. To be expert at this work requires considerable practice. For ordinarily well-set Black Hamburgh grapes, about one-third the number of berries require to be cut out; such varieties as the Royal Muscadine do not require to be so severely treated. It seems to the uninitiated a great sacrifice to cut away so many, the thinned bunch appearing quite a skeleton; but as each berry, when fully grown, should be nearly 1in. in diameter (oftentimes more), there is nothing gained by leaving more than space actually permits. In thinning, first trim the bunch, if required, into proper shape, then continue by cutting out all the inside berries, next all the small berries, and then the side berries. The expert hand will cut these off two or three or more at a time. It will now only remain to regulate the growing berries to the required distance apart.

With larger bunches it is frequently desirable to tie up the shoulders, and so spread the bunch out, or to loop them up to the trellis with S-shaped pieces of thin wire of the requisite length, or to prop the shoulders up from underneath with little bits of wood: the berries, as they swell, lift each other up, and the clusters thus remain compact. Care should be taken not to make the bunches too thin. They should be so thinned that, when ripe and cut, the bunch or cluster may remain firm and compact, whilst every berry has been allowed to develop itself freely to its full size. As a general rule, the Vines require to be gone over twice before the stoning period, and once after, during what is termed the "second swelling," in order to remove all small berries, and otherwise regulate the bunches In the great Vine-growing establishments, the major part of this work is performed by women and young persons.

FORCING. Since the introduction of orchard-houses, ground vineries, and other unheated structures for the cultivation of the Vine, this term, at one time very expressive of a definite condition, has become nearly obsolete. Any means that may be adopted for the forwarding of the growth of a plant to a greater extent than would take place naturally, may be termed forcing. Heat is the motive power. Some Vines are forced in spring, to induce them to commence growth early; others require forcing in autumn, to ripen their fruit. The Vine growing in an unheated orchard-house—that is, not heated artificially—is forced by solar heat to a certain degree.

Vines may be forced into growth, and to bear fruit at any season of the year, provided that the wood is properly ripened. Early-forced Vines of one season force more readily the following year, and established Vines always more easily than young ones. To secure early grapes, say in April, the Vines should be started into growth in November. The time required from the commencement of growth to the ripening of the fruit is, for the Black Hamburgh, about five months. Thus, Vines started in March should have fruit ripe at the end of July, and

Vine—*continued.*

those coming naturally into growth by the end of March, in August and September. The Muscat of Alexandria, Gros Colman, Alicante, Lady Downes' Seedling, and other late grapes, require nearly six months to ripen thoroughly. If, say on January 1, we take as an example a vinery from which ripe grapes are required to be cut in the month of June, the management or treatment necessary to secure this end may be stated in general terms, as follows:

Temperature. At the commencement, a night temperature of about 60deg. will be sufficient until the Vines have started growing. The heat should be gradually raised to 70deg. by the time they come into flower. When the grapes are fairly set, a lower temperature may be maintained until after the stoning period, when, if necessary, a rise of a few degrees may be allowed. When the grapes commence to colour, the temperature may be lower, but fire-heat is nearly always required, in order that a bracing atmosphere may be maintained. For day temperatures a rise of 5deg. by fire-heat may be allowed in dull, cold weather, and of 10deg. or more if by sun-heat, up to 80deg. or 90deg., as the season advances. In very cold weather, however, it is better to have a lower temperature than to maintain a high one by overheated pipes.

Ventilation. The object to be attained by ventilation is not merely the maintenance or regulation of the temperature, but also the admission of fresh air. The night temperature is mostly regulated by the amount of artificial heat applied; but the day temperature, or amount of sun-heat, is regulated by ventilation. In Vineries a little air should be admitted by the top ventilators early in the morning, or as soon as it may be observed that the temperature has risen or is rising above the required point, and this air should be gradually increased as the day and the temperature advance; and soon should be reduced in like manner, endeavouring, if possible, to shut up early enough to secure a slight rise in the temperature after doing so. Closing early at all times, and "bottling up," as it were, the sun's warm rays, is desirable. As the grapes begin to colour, air must be freely given, both by day and by night.

Moisture. This, in its relation to the atmosphere, is of great importance to the healthy progress of the Vine. A close, moist atmosphere is necessary to induce the buds to break freely, and afterwards to assist in supplying nutriment to the Vines through the leaves. Again, moisture is requisite to prevent the destruction of the leaves by insects.

From the commencement, then, a humid atmosphere must be maintained: the higher the temperature, the greater the evaporation, and the greater the amount of moisture required. When the Vines are started, they should be syringed regularly several times a day, especially if the weather be bright and warm, beginning as soon as it is perceived that the temperature is rising, and so on, varying as to time according to season, &c. This treatment may be continued until the Vines come into flower, at which period a somewhat drier atmosphere should be maintained until fertilisation has taken place. Syringing must from this time be discontinued: on account of the lime present in almost all water, the berries become spotted and soiled by its use. Every portion of the house and border, however, should be freely watered at all times, and the atmosphere kept well charged with moisture.

When the grapes are beginning to colour, a somewhat drier atmosphere is required; and by the time they are ripe, the air should be kept as dry and bracing as possible. After the grapes are cut, if it be during the growing season, the syringe should be again freely employed to thoroughly cleanse the leaves and wood, and its use continued until they ripen off.

Vine—*continued.*

POT CULTURE. The growing of Vines in pots is of a twofold character: first, that of producing plants for planting-out, subsequently to be grown as permanent Vines; and secondly, that of producing plants for fruiting in pots. Some cultivators grow the Vines obtained from eyes "struck" in early spring to their "fruiting state" the same season. Others strike the eyes, and grow the plants on so far, and the following year cut down, re-pot, and grow on again, thus occupying two years in producing a similar result. The one-year-old plants, if properly grown, are generally considered the better; but they are only produced under very favourable conditions, requiring an excessive amount of care and attention, and cost, possibly, more than the two-year-old plants, or "cut-backs," as they are familiarly called.

Potting. Liberal pot room must be provided, so as to grow the Vines quickly; therefore, as soon as it is found that the roots have reached the bottom or sides of the pot, re-pot into a 5in. or 48-sized pot, from this, immediately the roots have again reached the bottom, into an 8in., and from this into a 10in. or 12in. pot, which is called the fruiting-pot. This last size will be found quite large enough for all practical purposes. Plants that are intended to be grown the second year need not be potted into larger than 8in. pots. After the last shift, which should not take place later than the beginning of July, when the pots get stored with roots, they should be liberally top-dressed from time to time; this top-dressing will be found to get filled with fibry roots.

Soil. The best, fresh, fibry loam that can be procured, with the admixture of broken charcoal, and a little bone-dust and decayed manure, should be chosen for the first potting; the rougher the condition in which the soil is used, the better. The pots must be carefully and efficiently drained. For the second and third pottings, the soil may be somewhat richer. Top-dressings should consist of half-rotted manure mixed with the soil, together with some horn-shavings or bones. Care must be taken, in potting, to have the soil of the same temperature as that of the houses in which the plants are growing, and the Vines should be potted in the same place if possible, so as to prevent any possibility of chill from exposure, the check to their growth arising therefrom being extremely injurious at this stage.

Watering, &c. Abundance of water is at all times necessary for growing Vines. They should be syringed several times a day, and the atmosphere kept continually charged with moisture. When the fruiting-pots are full of roots, liquid manure should be frequently applied.

Temperature. Vine-eyes, on being struck, should be plunged in a bed having a bottom-heat of 80deg., and an atmospheric temperature by fire-heat of 65deg. or 70deg., which, by sun-heat, may be allowed to rise to 90deg. or 100deg. Too much sun-heat can scarcely be indulged in, if the atmosphere be plentifully charged with moisture. The same regulations as to temperature apply throughout the season, or until the Vines begin to ripen. Bottom-heat is not requisite when the plants attain a large size.

Training, &c. As the young Vines grow, they require to be staked, and to have the tendrils and lateral shoots pinched off as they are put forth. The leading shoot should not be stopped until it has grown to the required length. When the Vines have arrived at their full length, from 6ft. to 10ft. as the case may be, they must be stopped, and the laterals, as they appear, kept closely stopped also to the first leaf, in exactly the same manner as recommended for permanent Vines. When the canes are ripened, which may be in November, they should be at once pruned; that is, all the lateral spurs should be cut off, and the stem cut down to the length required—from 5ft. to 8ft., according to its strength.

Vine—*continued.*

The young Vines, whilst growing, should be kept as close to the glass as possible; and as they increase in length, a good situation for them is along the front of a low pit or house, training the rods to a trellis against the roof. In this manner the whole of the leaves, &c., are fully exposed to the sun's influence, and well-developed fruiting-buds are produced the entire length of the rod.

Ripening the Canes. The ordinary method, towards the end of the season, when the Vines are fully grown and show signs of ripening off, which they will do naturally, is to give gradually more air and less water, and after a short time to allow them to be fully exposed or removed to the open air. The plants, however, should never be allowed to flag or suffer from want of water.

Production of Fruiting Vines in Two or more Years. The treatment required is practically the same as that recommended for the one-year-old Vines, with this difference, that, instead of beginning with "eyes," young plants have to be dealt with. In winter, these young Vines should be cut down to one or two eyes or buds; and in January or February, the pots should be placed in heat. As soon as the eyes have started, the plants should be re-potted, the old soil being shaken out and new soil applied. The smaller the pot that will contain the roots, the better. The plants should be plunged in bottom-heat, and re-potted as required, and as already directed. These "cut-back" Vines, having somewhat the start of the "eyes," generally form the largest and strongest plants. They may be, and sometimes are, grown to a great size, and potted into the largest pots, when they produce enormous crops, some twenty-five or thirty bunches on a single plant, notable examples of which have been often exhibited by Messrs. Lane and Son, of Berkhamsted. Some of these large Vines may be fruited in pots for several years.

Treatment of Fruiting Vines. The forcing of pot Grapes may commence in November, or at any subsequent period. Those selected for early forcing should be the first ripened, and the canes should have been pruned quite a month before their introduction to heat, otherwise they may bleed. The use of well-ripened canes is a most important matter for early forcing.

A low house or pit is the most suitable for pot Vines. They have simply to be placed on a shelf along the front; or the pots plunged in a slight hotbed. The temperature at first should not exceed 50deg. by artificial heat, but must be increased, as the eyes break and begin to grow, to 60deg., and about the flowering period to 70deg. or thereabouts. With sun-heat the temperature should range much higher; but in this respect the treatment of pot Vines as regards general management, atmospheric conditions, ventilation of the house, &c., is exactly similar to that of plants grown in the ordinary Vinery.

After the Vines are placed in heat, water must be very sparingly applied for some time, until the roots commence growing, otherwise the soil will become sour and the roots will decay: it is better to allow them to be a little dry than otherwise. As the plants come into full leaf, a copious supply of water will be required. Whilst the fruit is ripening, extreme care is necessary—especially if the crop be a heavy one—to maintain the Vines in a thoroughly healthy state. Careless watering will destroy the best of crops; more failures are attributable to this cause than to any other. Liquid manure should be frequently given to the healthy plants.

Re-potting is seldom required. The best time to re-pot is about the period of the setting of the grapes, the roots being then in an active state, so that they soon take to the new soil. Top-dressings of soil mixed with horn or bone shavings, &c., should be freely applied.

As to their cropping capabilities, a strong Black Hamburgh Vine, in a 12in. pot, may be allowed to bear 8lb. or 10lb. of grapes—from six to eight fair-sized bunches.

Vine—*continued.*

A Royal Muscadine Vine should bear from ten to twelve bunches; but this is dependent upon the strength and health of the plant.

The ordinary or utilitarian method is to train Pot Vines to a fixed trellis, the plants being placed about 2ft. apart, so that when the side shoots with the fruit, &c., are trained out, the whole trellis may be covered. Another mode is to twist the canes coil fashion round two or three strong

FIG. 184. FRUITING POT VINE.

stakes placed in the pot (as in Fig. 184), thus giving the plants, when fully grown, the appearance of columnar bushes. Another mode is to train the shoots so as to form a sort of umbrella-shaped head, with the bunches hanging round. These latter are all more or less graceful and ornamental.

Varieties. The varieties best suited for fruiting in pots are the free-bearing kinds, such as Alicante, Black Hamburgh, all the Chasselas group, Foster's White Seedling, Madresfield Court, Royal Ascot, and Royal Muscadine. The Muscat of Alexandria is difficult to cultivate in pots, and Gros Guillaume scarcely shows any fruit at all.

CULTIVATION ON OPEN WALLS. Grapes were, at one time, much more extensively grown in the open air in this country than they are at present. This may principally be ascribed to the following causes: (1) The introduction of cheap glass, whereby structures for the cultivation of the Grape Vine with a considerable degree of success, may be erected at a moderate cost. In olden times, the seasons were not always propitious and suitable for Vine-growing any more than they are at the present day, although we read accounts of some very fine fruits having been grown on open standards in 1818. (2) The Mildew, the intrusion of which scourge to the Vine, in the year 1847, has rendered its cultivation in the open air in this country extremely precarious. Although sulphur is well known as a remedy, its application to Vines in the open air is not so easy to accomplish, and, therefore, the results are not so effectual as could be desired. It is very seldom now that outdoor grapes entirely escape this malady. (3) A series of cold, sunless seasons, in which the outdoor

Vine—*continued.*

grapes have seldom ripened, so that their cultivation has gradually come to be nearly abandoned. If a little more attention to the proper culture of the plant, and to the thinning and taking care of the fruit, were given, no doubt better results would follow; and it seems a pity we do not see Vines more frequently adorning the walls of our cottage homes in the more southern parts of the country. There the Grape Vine would be not only ornamental but useful. As a plant it is perfectly hardy, and it grows freely. In spring the young shoots are sometimes injured by late frosts, and in cold seasons the wood does not ripen thoroughly, but it is the fruit that is tender, and that only in so far as it generally requires more heat than our climate affords to ripen it.

Soil. The Vine will grow in any good garden soil which is freely exposed to light and air, and well drained; the more of a loamy character it has, and the fresher it is, the better. Before planting, the soil should be well dug or trenched to a fair depth, and some well-decayed manure, ground bones, &c., applied.

Position. This must be warm and sheltered—a wall facing the south, or a roof sloping in the same direction. Any other aspect is useless.

Planting should be done early in the autumn, so that the roots may get into action before winter.

Pruning and Training must, to a certain extent, be very similar to the practice adopted under glass. Vines to be trained to single stems should be planted about 2ft. apart, and pruned on the spur system. It is preferable, however, to allow Vines on open walls to cover a greater space, and to have many stems or branches. These may be trained in an upright direction, at about 1½ft. apart, and may be pruned on the spur system; another method is that of training the stems in a horizontal direction. Thus, at the first pruning, the Vine is cut down to a height of about 1½ft., and three shoots or stems are trained up the first year. At the winter pruning, one of these stems is trained out horizontally to the right, the other to the left; these, being pruned according to their strength to 4ft. or 5ft. in length, form the first or lower tier of branches on which the fruiting shoots or spurs are to be produced. The third shoot is trained upright; if strong, it may be pruned to 4ft. or 5ft. long, and the following season one or more side branches may be added in a similar manner, the distance apart being 18in. or 20in. The fruit-bearing shoots may be about 1ft. apart, and should be nailed in on the upper side of the stems only. Vines so trained may be extended to any distance, and pruned in winter in the usual manner. Disbudding must be carefully attended to, and the bearing shoots regularly stopped at one leaf beyond the fruit; and all the lateral shoots subsequently produced must be carefully removed.

To secure the best results, the bunches and berries should be carefully thinned, and, in the case of white grapes, fully exposed during the ripening period to the rays of the sun. If long, straggling bunches are produced, it is better to shorten them, as short, compact bunches ripen best.

Varieties. The greater portion of the Sweetwater section, with a few of the smaller Muscats, will be found more or less suitable for cultivation in the open air. In France the variety met with is invariably the Chasselas de Fontainebleau, which in this country is known as the Royal Muscadine. As grown in France, with the beautiful cinnamon-russet colour, it is very rich and pleasant. The Royal Muscadine is, at the present time, the leading grape for outdoor culture. A much better variety, not yet sufficiently well known, is the Chasselas Vibert, which produces larger berries, and ripens about a fortnight earlier, than the Royal Muscadine; Ascot Citronelle, Black July, Espiran, and Grove End Sweetwater, may also be recommended. In some

Vine—*continued.*

warm seasons, the Black Hamburgh ripens its fruit very well.

KEEPING THE FRUIT. Grapes, unlike most other kinds of fruit, will keep in a ripened state, and in a usable condition, on the plant for a long time, a certain amount of nourishment being necessary to the maintenance of the berries in a properly fresh and plump condition. If severed from the Vine, they soon shrivel or decay, unless the stalks be placed in water, or sustenance be provided in some other way. Properly ripened, and placed under favourable circumstances, grapes will keep in excellent condition for a long time. Some varieties possess this keeping property to a greater extent than others. The fact of being thus able to keep ripe grapes prolongs the season of their use, and assists in maintaining a continuous supply.

The cultivation of the Vine in glass-houses is the primary means by which we are enabled thus to keep its fruit. Grapes grown in the open air cannot be preserved for any length of time on account of the weather, but in vineries they are under control. Houses, therefore, that are required for late or keeping grapes should be so constructed as to meet the special requirements of the case; and these are an equable temperature and a dry atmosphere, which are maintained by proper heating powers and thorough ventilation.

Grapes that are required for late use should be ripened by the end of September. When the fruit becomes ripe, the most active period of the growth of the Vine is past; but it is not well, although a very old custom, to keep the borders and the roots dry. The artificial drought is injurious to the roots, which are still in action, and not beneficial to the fruit, for the longer the foliage can be maintained fresh and green, the better the grapes will keep. Constant supervision is necessary, and great care should be taken to remove any decaying berries, keeping the temperature as near 45deg. as possible.

Ripe grapes may be kept in good condition on the Vines until March, or later if carefully shaded from the sun, and a cool, dry atmosphere be maintained. If allowed to hang until the rise of the sap, the operation of pruning is likely to be injurious to the Vines.

Bottling Grapes. Grapes may be cut from the Vines, and, having their stalks placed in bottles of water, may be kept in a fruit-room, or other suitable apartment, in almost as perfect a condition as those that are allowed to hang on the Vines; and where the quantity is limited, this can be done at much less expense. Further, they may thus be preserved to a later period than it is possible to keep them on the Vines. This is a method of keeping grapes that has been for some time adopted in France, although it was scarcely known in this country until brought under notice by Mr. Robinson, in his "Parks, Promenades, and Gardens of Paris," in 1869. It is now, however, adopted, with modifications, in many establishments in this country. The originator of the system was M. Rose-Charmeux, of Thomery, who had a small room in his house fitted for the purpose, from which light and air were, as far as possible, excluded.

One of the best examples of this method is that used at Ferrières, near Paris, the seat of Baron Alphonse de Rothschild, where M. Bergmann, the excellent gardener, has a grape-room specially fitted for the purpose, and in this all the grapes are placed as they become ripe. Fig. 185 is an illustration of his mode of fixing the bottles, and Fig. 186 shows the arrangement of screens or partitions adopted within the room for the convenient stowage of the bottles when in use.

The ordinary fruit-room will not answer for this purpose; the grapes cannot be kept with other fruits,

Vine—*continued.*

as they require special provision made for them. A thoroughly dry, close, dark room, wherein an equable temperature of 40deg. to 45deg. can be maintained, is what is required. Dryness is the first consideration, so, if a separate room has to be constructed, it should be built with hollow walls and a double set of doors, in order to counteract the effects of fluctuations in temperature and moisture. The grapes intended to be thus kept should be cut with a considerable portion of the shoot attached, and the end of the shoot placed in a

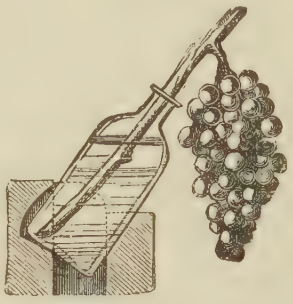

FIG. 185. MODE OF FIXING BOTTLES FOR GRAPES.

bottle filled with pure water. Opinions differ as to whether the fruit is deteriorated in quality by being thus kept. It is obvious that support is derived from the water, and this subsequent absorption of water can scarcely act otherwise than to reduce the amount of saccharine properties in the fruit.

The best late-keeping Grapes are those varieties having thick skins, viz.: Alnwick Seedling, Gros Colman, Gros Guillaume, Lady Downes' Seedling, Muscat of Alexandria, Trebbiano, West's St. Peter's, and White Tokay. It is

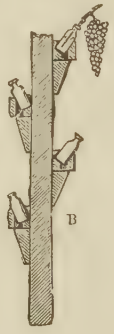

FIG. 186. SECTION OF PORTION OF UPRIGHT FOR SUPPORTING BOTTLE-RACKS.

difficult to keep Black Hamburgh Grapes in good condition on the Vines after Christmas; but if cut before that time, and placed in bottles, they may be had in a sound state during the month of January.

DISEASES, &c. These have been far more studied in France and in other Continental countries, than they have been in England, since in the latter country Vines are more especially luxuries, grown in greenhouses; while on the Continent they are among the most valuable of cultivated plants, and their destruction from any cause may mean ruin to their cultivators. Hence, the greater part of our information with regard to the diseases of Vines,

Vine—*continued.*

and the appropriate treatment for each, is due to the researches of French and German biologists. The causes of disease are various, including excess or defect of warmth, moisture, exposure to light, and food, defective ventilation of vineries, attacks of Fungi and of insects and other animals. Two diseases to which Vines are liable have been already treated of under **Shrivelling** and **Sun-burning**. The former is due to insufficient supply of water, either because of its deficiency in the soil, or because of the roots failing to transmit a proper amount to the leaves and fruit. The latter may be due to the roots being too few for the necessities of the plant, or to coldness of the soil after the air of the vinery has induced active growth in the young shoots and leaves. The plants may also suffer, in ill-ventilated vineries, from "sun-burning" of the leaves, small portions becoming brown and dry, in the manner described under **Sun-burning.**

Bleeding. A term applied to an overflow or outpouring of watery sap, although there is no real analogy between this flow of water and the efflux of blood in animals. The Vine is furnished with an enormous supply of this watery sap, which flows very freely, and with great force, shortly after growth commences, until the plant gets into full leaf. The cause of bleeding is late pruning or otherwise cutting the Vine at this period. This loss of sap is sometimes excessive, and is then injurious to the Vine. There is no ready means of arresting the flow when once it has commenced. To avoid its occurrence, Vines should be pruned early.

Shanking. One of the most perplexing maladies that affect the Vine. The term is used to denote the drying-up or withering of the stalks of the bunches or berries; the berries that thus shank, or lose the vitality of their stalks, become intensely sour, and never ripen. Sometimes, it is only a few berries; in other cases, it is the whole bunch, or maybe the entire crop. Many and varied opinions as to the causes of shanking have been advanced. In a broad sense, it is, no doubt, the result of some overstrain, some bad condition of, or injury to, the feeding or respiratory organs of the plant—either the foliage has been in some way injured or prevented from performing its proper functions, or the roots have got into bad condition, and cannot perform theirs; or it may be due to a combination of both these causes. As to the more immediate causes, we note the following: Over-cropping; the destruction of the foliage by Red Spider or other agency; the stripping-off of a great quantity of leaves at one time, as is frequently done by those who neglect timely stopping; chills, or sudden changes of the temperature of the house; the roots getting into a cold subsoil, or the border becoming wet and soddened, &c.; planting in borders composed of too rich materials; excessive dryness at the roots, such as to cause injury to these organs, &c.—all of which should be avoided.

Adventitious or Air Roots. These are so called from their being produced on the stem of the Vine, and suspended in the air like so many threads. They are of the same character as the proper roots, only requiring to be brought into contact with the soil to become such. Air roots are sometimes produced in great profusion from every part of the stem, frequently attaining 1ft. or more in length, and so give the Vine a strange appearance. There is no particular harm in these adventitious roots, *per se*, but their presence betokens a want of proper action on the part of the true roots running naturally in the soil. They are a sign of bad health, and are frequently the precursors of shanking; they give evidence that the proper roots are not in a condition to supply the great demands of a large expanse of foliage, &c., and that, aided by a warm, moist atmosphere within the house, Nature is trying to supply this want. Close warmth and moisture will induce the formation of such roots from Vine-stems

Vine—*continued.*

at any time; but if the true roots in the border are in a perfectly congenial condition, no air or adventitious roots will be produced in any ordinarily well-managed vinery. They are, in short, mainly the result of the roots being in a cold, wet border. To prevent their formation, or to recover Vines subject to this evil, the amelioration of the borders must be effected, by taking up the Vines, examining the condition of the drainage, renewing it if found necessary, and adding fresh soil. Some varieties of Vines, such as those of the Frontignan class, being of a tenderer constitution, are more subject to the formation of air roots than others. When such roots are produced, they need not be cut off, except for appearance' sake, for they will wither and die as the wood ripens.

Fungi as causes of disease are treated of under **Vine Fungi.**

Animal Pests. The animals, &c., destructive to Vines are numerous, and the number recorded as hurtful is being added to almost every year in Europe and elsewhere; especially is this the case in America, on which continent animal pests are even more abundant and varied than in Europe. By far the most dangerous insect-foe is the *Phylloxera vastatrix*, of which a full account is given (with a statement of the appropriate remedies to be employed against it) under **Grape or Vine Louse.** This insect has destroyed the contents of many vineries in Britain, and has devastated extensive vineyards in many parts of the Continent. It has been peculiarly destructive in France. Its galls on the leaves are usually very numerous and very conspicuous; but the less prominent root-galls are even more fatal to the Vines. In mid-Europe, a Gall-midge (*Cecidomyia œnophila*) produces galls on the leaves not unlike those of *Phylloxera*; but an examination of a gall will disclose the Midge larva in the central cavity. This Midge has not been recorded as British. The stems and branches are liable to be infested by certain species of **Scale Insects** (which *see*) on the American and European continents, but none have yet been recorded from Britain. Several kinds of Beetles, besides Weevils (*see* **Vine Weevils**), do considerable injury to the leaves and the young twigs, the more noteworthy being *Anomala Frischii* and *A. Vitis*. They resemble Cockchafers a good deal in form, but are only about ⅓in. long, and are usually satiny or metallic green or blue, with a clay-yellow band round the sides of the thorax. Both they and the Weevils are found more or less frequently in England, and may prove injurious in vineries. When hurtful, their numbers may be reduced by the methods detailed under the headings quoted. Many species of *Lepidoptera* feed on Vines; they are discussed, and remedies are given, under **Vine Moths.** *Aphis* (*Hyalopterus*) *Pruni* is recorded in Buckton's "British Aphides" as living on Vines, as well as on other plants. For appropriate treatment, *see* **Aphides.**

Among Mites, the worst foe to Vines is the Red Spider (*see* **Tetranychus telarius**), which sometimes seriously injures the plants at the period of setting of the fruit, when the supply of water is limited, to improve the flavour. When the attack is severe, the leaves may be so seriously injured that the fruit cannot be properly matured. The Mites may be destroyed by the methods detailed under **Tetranychus telarius.** It is important, as a preventive of attacks, to allow the roots a good supply of water, and to keep the atmosphere of the house sufficiently moist while the grapes are forming, the amount of water being reduced only after they are beginning to colour. Another Mite that does harm on the Continent of Europe is *Phytoptus Vitis* (*see* **Mites**), which causes a dense growth of pale hairs to appear on the lower surface of the leaves, either in isolated patches, or almost covering the whole surface. This growth was formerly regarded as a Fungus, and was

Vine—*continued.*

named *Erineum Vitis*, or *Phyllerium Vitis*. The plants may be only slightly weakened by these growths; but in bad attacks the leaves are unable to do their work in the nutrition of the Vines, which suffer in consequence. The best remedy is picking off, and burning, the diseased leaves.

The last animal to which we shall refer as causing diseases in Vines, is a Nematoid Worm (*Heterodera radicicola*) This is nearly related to *H. Schachtii* (mentioned under **Nematoid Worms**); and, like that species, it produces small swellings on the roots of very many kinds of plants, including Vines, which become much weakened, or are killed by them. The only remedy, so far as is known, is to carefully remove, and to burn, the diseased plants, so as to prevent the evil from spreading.

SORTS. The varieties of Grapes, like those of all other cultivated fruits, are extremely numerous. In its wild state, the Vine exhibits considerable variation, and under cultivation, in the different climates and countries, sorts obtained from seed have been selected as suited to special conditions and requirements. Thus, in some parts thin-skinned, fleshy grapes prevail, and in others, possessing a warmer and drier climate, the thick-skinned varieties preponderate. In the various wine-growing countries distinct classes of grapes seem to exist, whilst those of America belong to a distinct species, *Vitis Labrusca*. It is altogether impossible to estimate the number of varieties existing. In this country, grapes being exclusively grown for dessert, the number of varieties in general cultivation is comparatively limited. Miller, in 1768, describes 18 sorts; Speechly, in 1791, records 50 sorts; Forsyth, in 1810, 53 sorts; Thompson, in the Horticultural Society's Fruit Catalogue, in 1831, records 182 names; Dr. Hogg, in the "Fruit Manual," 1875, describes 143 varieties; and in Barron's "Vines and Vine Culture," 100 varieties are fully described, and mostly illustrated, all of which have fruited in the Royal Horticultural Society's Gardens, Chiswick, and from which the following selection has been made, comprising nearly every variety that is worthy of cultivation:

Varieties of European Grapes
(*Vitis vinifera*).

Until a few years ago, the Grapes grown in this country were entirely selected from other countries, but of late years several remarkably fine varieties have been raised in Britain, by careful hybridisation, and are now being introduced in the wine-growing districts.

Aleppo. Fruit variously coloured, some being black, others green or striped with black, small, round, having a singular appearance; flesh soft, sweet, watery; bunches small, loose. An early Sweetwater Grape.

Alicante. Fruit quite black, with a thick bloom, large, of a true ovate shape; flesh squashy; flavour somewhat earthy, unless well ripened; skin thick and leathery; bunches large, averaging from 2lb. to 6lb. in weight, very broadly shouldered, conical and regular, closely set; stalk very stout. Late. Very handsome, and easily cultivated.

Alnwick Seedling. Fruit black, covered with a thick bloom, large, roundish-oval; flesh firm; flavour strong, sparkling, tolerably rich and sweet; skin thick and tough; bunches large, broadly shouldered, bluntly conical, shy setting. A good, useful, very free-fruiting, late Grape, which keeps well.

Anger's Frontignan. Fruit purplish-black, with a thick bloom, small, round; flesh firm yet tender, juicy, very sweet and rich, having a strong Muscat flavour; bunches small, tapering, very compact, closely set. Early.

Aramon. Fruit purplish-black, medium-sized, round; flesh firm, having a fine, brisk flavour; bunches long-tapering; stalk extremely brittle. Late. Second quality.

Vine—*continued.*

FIG. 187. BLACK CORINTH GRAPES.
Bunch, one-third natural size; Berries, full size.

Ascot Citronelle. Fruit pale greenish-yellow, small, roundish-ovate; flesh soft, juicy, very sweet, and richly flavoured. An early Muscat Grape, ripening several weeks before the BLACK HAMBURGH.

FIG. 188. BLACK HAMBURGH GRAPES.
About one-fourth natural size.

Ascot Frontignan. Fruit pale greenish-white, small, round; flesh firm, sweet, and with a strong Muscat flavour; bunches small, somewhat loose and straggling. Early

Vine—*continued.*

Auvergne Frontignan. Fruit clear white, changing to amber when fully ripe, medium-sized, round; flesh firm; flavour extremely rich and pleasant; bunches long-cylindrical, closely set. An excellent, early Muscat Grape for growing in cold houses.

Barbarossa. *See* **Gros Guillaume.**

Black Corinth. Fruit purplish-red, quite small, round; flesh sweet, juicy, and without seeds; bunches small, tapering. This interesting variety is the Sweetwater Grape producing the currants of commerce, and is largely cultivated in several parts of Greece. It is also known as the CURRANT GRAPE, ZANTE CURRANT, &c. See Fig. 187.

Black Frontignan. Fruit purplish-black, small, round; flesh very firm, with a fine, brisk, rich, sparkling flavour; bunches small, cylindrical, close and compact. An early Muscat Grape, useful for growing in cool houses.

Black Hamburgh, or **Frankenthal.** Fruit deep bluish-black, covered with a fine bloom, large, roundish-ovate; flesh firm, yet tender, juicy, and with a pleasant, rich flavour; bunches medium, ovate, with broad shoulders, compact. A mid-season Sweetwater. This is the chief Grape in cultivation. See Fig. 188.

Black July. Fruit deep purple, small, round; flesh sweet, juicy, not rich; bunches small, loose. An early Sweetwater Grape.

Black Monukka. Fruit purplish-red, small, long-ovate, or in shape like an acorn; flesh firm, tender, seedless, very sweet and pleasant to the taste; bunches very large, long-tapering. A distinct Sweetwater variety, of Indian origin. See Fig. 189.

Black Morocco. Fruit purplish-red, large, long-ovate; flesh very firm, juicy, with a rich, sparkling flavour; bunches large, long-tapering, generally badly set. A handsome, late Grape.

Black Prince. Fruit deep bluish-black, with a thick bloom, medium-sized, ovate, always well set; flesh dark, juicy and sweet, but not rich; bunches very long-tapering. A handsome, early, free-fruiting Sweetwater Grape.

Buckland Sweetwater. Fruit pale green, becoming almost white when over-ripe, large, round; flesh juicy and watery, with a pleasant, sweet flavour; bunches medium, short, broadly-shouldered. A free-fruiting, mid-season Grape, which sets well.

Canon Hall Muscat. Fruit pale straw-coloured, large, round; flesh firm, yet very juicy, with a strong Muscat flavour; bunches large, straggling, very frequently badly set. An extremely handsome, mid-season Grape, but somewhat difficult to cultivate.

Chaouch. Fruit clear straw-yellow, medium-sized, ovate; flesh tender, juicy, very sweet and rich; skin thin; bunches of medium size, somewhat loose, often badly set. An early Sweetwater Grape. This is the favourite Grape at Constantinople.

Chaptal. Fruit greenish-white, small, round; flesh firm, sweet, watery; bunches long-tapering, rather loose. A very free-growing, mid-season Sweetwater variety, resembling a large form of ROYAL MUSCADINE.

Chasselas de Florence. Fruit pale straw or nearly white, a great many of them assuming a violet hue, and others a cinnamon-brown, small, round; flesh firm, sweet, and pleasant; bunches long, medium-sized, well set. An early Sweetwater Grape.

Chasselas Musqué. Fruit pale greenish-white, changing to amber, small, round; flesh very firm, juicy, and with an extremely rich flavour; skin tender, very liable to crack when approaching maturity—so much so that the bunch becomes a mere skeleton; bunches long-tapering, setting freely. An early Muscat.

Chasselas Rose. Fruit clear rosy-red, small, round; flesh firm, juicy, sweet, and pleasant; bunches long-cylindrical, well set. An early Sweetwater; a pretty variety of the ROYAL MUSCADINE.

Chasselas Vibert. Fruit clear greenish-white, medium, round; flesh firm, tender, sweet, and pleasant; bunches small, compact, well set. A very early Sweetwater Grape.

Ciotat. Fruit clear greenish-white, small, round; flesh firm, sweet, and pleasant; bunches small, compact. Leaves very much cut or laciniated (hence the name PARSLEY-LEAVED GRAPE, sometimes used). An early Sweetwater Grape.

Dr. Hogg. Fruit clear greenish-white, medium, round; flesh firm, very sweet, and with a rich, Muscat aroma; bunches long-tapering, setting well. Mid-season.

Duchess of Buccleuch. Fruit greenish-white, changing to yellow when highly ripened, small, round; flesh tender, juicy, exceedingly rich, and with a strong Muscat flavour; bunches very long, cylindrical, well-set. A mid-season Grape.

Duke of Buccleuch. Fruit greenish-yellow, very large, round; flesh tender, very juicy, sweet, and exceedingly rich; bunches medium, short-ovate. An early Sweetwater Grape, somewhat difficult to cultivate.

Dutch Hamburgh. Fruit deep purplish-black, with dense bloom, very large, round; flesh coarse, and harsh in flavour; bunches medium, short, broadly shouldered, often setting imperfectly. A handsome, mid-season, vinous variety.

Dutch Sweetwater. Fruit clear greenish-white, medium-sized, round; flesh firm, juicy, sweet, and pleasant; bunches short, small, often badly set. An old, early Sweetwater sort, suitable for open-air culture

Vine—*continued.*

Espiran. Fruit deep purplish-black, medium, round: flesh firm, somewhat harsh; bunches small, tapering, well-set. A good, mid-season, open-air Grape.

Ferdinand de Lesseps. Fruit clear greenish-yellow, translucent, small, ovate; flesh very tender, melting, juicy, and sweet, with a strong aroma of ripe strawberries; bunches small, tapering. An early Muscat Grape.

FIG. 189. BLACK MONUKKA GRAPES.
Bunch, one-third natural size; Berries, full size.

Foster's Seedling. Fruit clear greenish-yellow, medium, oval flesh tender and melting, sweet and pleasant; bunches medium, shouldered, well set. An early Sweetwater Grape.

Frankenthal. *See* **Black Hamburgh.**

Golden Hamburgh. Fruit greenish-yellow, large, round; flesh soft, melting, watery; bunches medium, broadly shouldered. A mid-season Sweetwater Grape.

Vine—*continued.*

Golden Queen. Fruit greenish-yellow, golden when highly ripened, large, long-ovate; flesh soft, squashy, with a faint trace of Muscat; bunches medium, long-tapering, well set. A late Grape.

Vine—*continued.*

Gros Guillaume. Fruit deep black, with fine bloom, medium, round; flesh tender, juicy, with little flavour; bunches very large (sometimes exceeding 20lb.), long, regularly tapering, well set. A late, vinous Grape, generally known as BARBAROSSA.

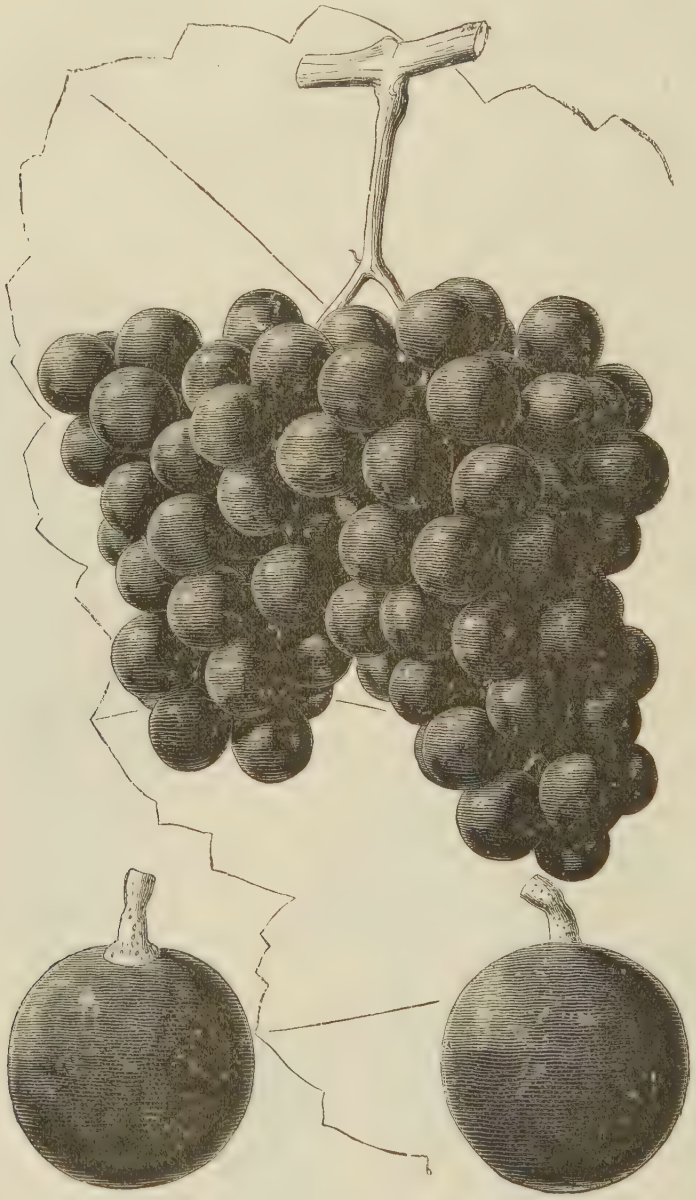

FIG. 190. GROS COLMAN GRAPES.

Bunch, one-third natural size; Berries, full size.

Grizzly Frontignan. Fruit of a dull red or grizzly colour, small, round; flesh firm, sweet, and with a rich Muscat flavour; bunches small, cylindrical, close, and compact. A mid-season Muscat Grape.

Gros Colman. Fruit black, with a thick bloom, large, round; flesh thick, coarse, with a poor, watery flavour; bunches medium, broadly shouldered, well set. An extremely handsome and excellent keeping, late, vinous Grape. See Fig. 190.

Gros Maroc. Fruit nearly jet-black, with a fine bloom, large, truly ovate in shape; flesh firm, juicy, with a brisk, rich flavour; bunches medium, well set. A handsome, late, vinous Grape.

Grove End Sweetwater. Fruit greenish-white, small, oval; flesh tender, melting, with a rich, sweet flavour; bunches small, well set. An early Sweetwater Grape.

Lady Downes' Seedling. Fruit black, large, round; flesh exceedingly firm, juicy, with a somewhat harsh flavour; bunches

Vine—*continued.*

medium, long-tapering, always well set. A good, late-keeping, vinous Grape.

Lombardy. Fruit red or grizzly, medium, round; flesh tender, with a pleasant, sweet flavour; bunches large, broadly shouldered, well set. A mid-season Sweetwater Grape.

FIG. 191. ROYAL MUSCADINE GRAPES.

Bunch, one-third natural size; Berries, full size.

Madeleine Royale. Fruit clear greenish-yellow, medium, oval; flesh tender, juicy, sweet, and pleasant; bunches small, broadly shouldered, well set. An early Sweetwater Grape.

Madresfield Court. Fruit purplish-black, with a fine, grey bloom, large, ovate; flesh firm, yet juicy, sweet, and rich, having a strong Muscat flavour; bunches large, long-tapering, well set. A very handsome and excellent, mid-season Grape.

Miller's Burgundy. Fruit jet-black with a thick bloom, small; flesh dark, juicy, with a pleasant, sweet, watery flavour; bunches quite small, cylindrical, compact and close. Leaves extremely downy on under surface (hence the name MILLER GRAPE, sometimes used). An early Sweetwater Grape.

Mill Hill Hamburgh. Fruit reddish-black, very large; flesh melting, juicy, sweet and rich; skin thin; bunches medium, broadly shouldered. An excellent, early Sweetwater Grape.

Mrs. Pearson. Fruit greenish-white, medium, round; flesh very firm, yet juicy, sweet, and with a rich Muscat flavour; bunches medium, well set. A mid-season Grape.

Mrs. Pince. Fruit purplish-black, coated with bloom, large, ovate; flesh exceedingly firm, very rich and sweet, with a strong Muscat flavour; bunches large, long-tapering, often badly set. A late Grape, which keeps well.

Muscat Champion. Fruit red or grizzly, large, round; flesh firm, yet juicy, rich, and with a strong Muscat flavour; bunches short, broadly shouldered. A mid-season Grape.

Muscat Hamburgh. Fruit purplish-black, large, long-ovate; flesh firm, yet juicy, rich, and with a decided Muscat flavour; bunches medium-sized, loose, broadly shouldered, often badly set. A mid-season Grape.

Muscat of Alexandria. Fruit greenish-yellow, golden when highly ripened, large, long-ovate; flesh firm, juicy, sweet, and rich, with a high Muscat flavour; bunches large, long-tapering. A very handsome and excellent, late Grape.

Vine—*continued.*

Muscat of Hungary. Fruit greenish-yellow, small, short-ovate: flesh firm, sweet, and having a decided Muscat flavour; bunches small, tapering. An early Grape.

Œillade Noire. Fruit deep black, with a fine bloom, large, long-ovate; flesh very tender and juicy, with a pleasant, rich flavour; bunches long, loose, and straggling. A mid-season Sweetwater Grape.

Raisin de Calabre. Fruit white, medium-sized, round; flesh firm, and possessing little flavour; bunches long-tapering. A late, vinous Grape, which keeps well.

Royal Ascot. Fruit purplish-black, large, ovate; flesh very firm, with a strong, piquant, plum-like flavour; bunches small, short, compact, well set. A mid-season vinous Grape.

Royal Muscadine. Fruit greenish-white, small, round; flesh firm, juicy, sweet, and exceedingly pleasant; bunches small, long-tapering, compact, well set. A good, open-air, early Sweetwater Grape, also known as WHITE CHASSELAS. See Fig. 191.

Syrian. Fruit greenish-white, large, ovate; flesh firm, juicy, sweet, and moderately rich. A late, vinous Grape, which keeps well.

Trebbiano. Fruit greenish-white, changing to pale amber when fully ripe, large, ovate; flesh firm, sweetly flavoured, but not rich; bunches very large (one example weighing 26½lb. has been grown), broadly shouldered, well set. A late, vinous Grape.

Trentham Black. Fruit jet-black, large, ovate: flesh extremely tender and juicy, with a sweet, rich, and very pleasant flavour; bunches large, loose, and straggling, often badly set. An early Sweetwater Grape.

Troveren Frontignan. Fruit, some greenish-yellow, others deep amber tinged with dirty-brown, small, round; flesh firm, crackling, very rich, and highly flavoured; bunches long, tapering, compact, well set. A mid-season Muscat Grape.

FIG. 192. STRAWBERRY GRAPES.

Bunch, one-third natural size; Berries, full size.

West's St. Peter's. Fruit deep purplish-black, medium, round; flesh firm, juicy, sweet, and at all times remarkably fresh; bunches medium-sized, tapering, well set. A late, vinous Grape, which keeps well.

White Chasselas. *See* **Royal Muscadine.**

White Frontignan. Fruit greenish-white, small, round; flesh firm, yet juicy, and very richly flavoured; bunches medium, long-cylindrical, well set. A mid-season Muscat Grape.

Vine—*continued.*

White Nice. Fruit pale greenish-white, medium-sized, round; flesh moderately firm, juicy, sweet, but not rich; bunches very large, somewhat loose and straggling. A late, vinous Grape.

White Tokay. Fruit greenish-white, large, ovate; flesh firm, with a sweet, pleasant flavour when well ripened; bunches large, broadly shouldered, well set. A late, vinous Grape.

Varieties of American Grapes (*Vitis Labrusca*).

These form quite a distinct class from the European Grapes. The American Vine is of a remarkably free and vigorous growth. The berries are small; flesh greenish, having a mucilaginous texture, and a strong musky perfume, with a peculiar "foxy," sweetish flavour; bunches small, produced in great abundance. The leaves are large, thick and leathery, very downy or pubescent on the under surface, and but slightly lobed. The varieties existing in America are extremely numerous, and are better adapted to that country than the European Grapes. The Strawberry Grape has been for many years cultivated in this country and in Germany, and by some persons is greatly esteemed. Those here described have been fruited at Chiswick.

Brighton. Fruit black, small; flesh tender, of a peculiarly sweet flavour; bunches small.

Duchess. Fruit white, medium; flesh brisk, sweet, and pleasant; bunches long, loose.

Eldorado. Fruit deep yellow, small, round, having a strong musky flavour; bunches small.

Golden Pocklington. Fruit clear yellow, round, small, juicy and sweet; bunches medium-sized, compact.

Jefferson. Fruit grizzly-red, large, roundish; flesh melting, of a brisk, sweet, pleasant flavour; bunches small.

Lady. Fruit deep yellow, small, round; flesh melting, musky, rich; bunches small, thinly set.

Moore's Early. Fruit purplish-black, with a fine bloom, small, round; flesh melting, sweet; bunches small, compact.

Strawberry. Fruit purplish-red, small, roundish-ovate; flesh dark, thick or mucilaginous; bunches small, compact, closely set. The ripe fruit emits a strong perfume of ripe strawberries or raspberries. See Fig. 192.

VINE. Any trailing or climbing stem.

VINE, CONDOR. A name given to **Marsdenia Cundurango** (which *see*).

VINE FUNGI. Many species of Fungi have been recorded as living on Vines in Europe and in North America, and there exists almost a special literature upon these parasites. They vary greatly in their destructive powers; and some species have ravaged the vineyards of both Continents. Inquiry into the best methods of contending with the parasites, and of saving the Vines from complete destruction, has thus been powerfully stimulated. In vineries in the British Islands, these pests have not caused so great harm as where the Vines are cultivated on a large scale; yet, even in Britain, the harm done is sufficient to render some notice of them desirable in this work. Of the hundred or more species that have been recorded as growing on Vines, only those that give rise to serious disease are mentioned below.

Vine Mildew is the name given when the leaves and stems become covered with a whitish or greyish coating, either in patches, or over large portions of the plants. Such an appearance is caused by more than one Fungus. The best-known are *Oidium Tuckeri* (which has long been known in Europe, and which was at one time most injurious in the vineyards of France, and also in those of Madeira), and *Peronospora viticola*, the latter a Fungus brought in recent years from America to France, on imported Vines.

Oidium Tuckeri was first described by the well-known botanist, Rev. M. J. Berkeley, from specimens sent to him, in 1847, by Mr. Tucker, a gardener in Ramsgate. It was detected in France in 1848. By 1851 it had spread to all the vineyards in Europe; and in the next year it was observed in Madeira. The Fungus shows itself as a thin, pale layer or coat on the leaves and on the young

Vine Fungi—*continued.*

twigs, and even occurs on the fruits. The diseased parts often become pale, and more or less distorted; the coat becomes thicker; then the spots become brown, and the parts die. An examination with the microscope shows that the surface of the part is covered with the filaments of the Fungus creeping over the epiderm cells of the diseased spots, and that from the side of each filament of the Fungus little suckers are pushed into the epiderm-cells, and absorb food from them for the Fungus. From the other side of the filaments erect branches arise, each formed of a row of cells, of which those at the ends of the branches (conidia) are oval, and break away, to produce the Fungus again when they fall on suitable situations on the Vine leaves or branches. No other mode of reproduction has yet been detected in this Fungus, though it undoubtedly belongs to a more fully-developed form, such as is described under **Mildew** and **Oidium.** Mr. Berkeley has suggested that it may belong to the very common *Erisyphe communis*. Plants suffering from its attacks have a mouldy, disagreeable smell. Another *Oidium* (*O. Balsamii*), with more slender conidia, sometimes occurs on Vines. The Fungus spreads rapidly in a moist, warm atmosphere, and is greatly checked in dry air, and also by very heavy rain, which washes away the spores.

All dead leaves and stems should be removed and burned, to destroy the conidia. Flowers of sulphur form a complete and thorough cure, as they destroy the parasite without injuring the Vines. The sulphur should be dusted on the Vines in early spring, after the stems have begun to push forth, then again when the blossoms have opened, and lastly, when the grapes are beginning to ripen. To prevent any taste of sulphur being perceptible in the ripe fruits, the third dusting must not be too late. The green organs to which sulphur is to be applied should be moistened, to make the powder adhere.

Peronospora viticola had been known, from 1834, as a parasite on almost all the Vines of North America; but it was imported into Europe only in 1878, on plants brought to replace the European Vines destroyed by *Phylloxera*. It has now spread widely through France and Algeria. The diseased leaves, about August, show patches of irregular form, and whitish in colour, which soon become brown and dry. The tissues of the leaf are traversed by mycelium, furnished with small haustoria, or suckers, for taking food from the cells; and the white spots bear myriads of erect, fruiting branches of the Fungus (*see* **Peronospora**), each repeatedly divided into three, less often into two, branches. The terminal branches are short, and on the tip of each is an egg-shaped spore. In the spore there grow five or six smaller spores (zoospores), which escape by the bursting of the cell-wall of the spore, and can swim about in dew-drops and moisture of any kind; and at last the zoospores settle down on the leaves, push a slender tube through the epiderm, and give rise to a new plant. The diseased plants produce defective crops of fruit. The grapes also may be attacked. The resting, or sexual, spores of the Fungus have been found in *Vitis æstivalis*; they have a thick, smooth, yellow coat.

Vines grow more healthily in well-watered than in dry soil, and are therefore better able to resist the attacks of the parasite; but a close, moist atmosphere is hurtful, as it encourages the growth of Moulds. The fruiting threads may be destroyed by dusting the plants with a mixture of sulphur and quicklime; but the internal mycelium renders a thorough cure very difficult. Probably the best preventive of the disease is burning dead leaves, stems, prunings, &c.

Several other species of Fungi have been recorded as very destructive in the vineyards of France, Germany, and Italy; but they have not been observed to be hurtful

Vine Fungi—*continued.*

in England, and therefore require but brief notice here. The roots have been found destroyed by four different Fungi, viz., the *Rhizomorpha*, stage of *Agaricus melleus*

FIG. 193. MASS OF AGARICUS MELLEUS ON ROOT OF YOUNG PINE —*a*, *a*, Mycelium in form known as *Rhizomorpha fragilis*; *b*, Very young Spore-bearers produced on *Rhizomorpha fragilis*; *d*, Older Spore-bearers (*Agaricus melleus*) produced by Mycelium of form known as *Rhizomorpha subcorticalis*.

(Figs. 193 and 194) (*see* **Pinus,** FUNGI), *Dermatophora necatrix*, *Roesleria hypogæa*, and an imperfect mycelium enveloping the lateral roots, and called by Persoon

FIG. 194. RHIZOMORPHA FRAGILIS *var.* SUBCORTICALIS. Mycelium of *Agaricus melleus*, in the form it assumes when growing between the Bark and the Wood—*a*, Form intermediate between *fragilis* and *subcorticalis* expanding into the latter on the left; *b*, Portion where growth is slower; *c*, Lobed Margin; *d*, *d*, Margin that has reached cut surface of Stump; *e*, Wood of Stump of Fir-tree.

Fibrillaria xylotricha. These Fungi differ in details of their attacks on the Vine roots; but they all kill the roots, usually beginning with the younger ones; the leaves turn yellow and fall off; and the Vines perish, though some continue to exist in a sickly state for one or two years, if left untouched. Against these root-parasites, the only effectual remedy is to remove and burn the diseased plants, taking the utmost care to remove all fragments of wood, &c., from the soil, to prevent the disease from reaching healthy subjects. No cure is known for plants already attacked by any of these Fungi.

Another disease very fatal in European vineyards assumes the form of dark spots on the young shoots and leaves, on the flower-stalks, and on immature fruits. At first the spots are round, brownish pustules; but they soon extend, and often become confluent. The centre becomes ashy-grey or pinkish-grey, owing to the outpouring of minute, oval conidia through the torn epidermis; but the rest of the spot becomes nearly black. It is surrounded by a narrow, brown border. All the surface tissues of the

Vine Fungi—*continued.*

spot are hardened, and are full of the mycelium of the Fungus; and the conidia or spores are produced on the surface of the mycelium, but below the epidermis, through a tear in which they escape when mature. This Fungus is known as *Glœosporium ampelophagum.* Those parts of the Vines on which it grows are killed or seriously stunted, and even the plants themselves may be killed in bad attacks. When it grows on the flower-stalks, the entire clusters of fruit are destroyed. When it occurs on the grapes, they seldom come to ripeness. The disease has attracted much attention; and it is said that an effectual cure for it has been found in the employment of a solution of sulphate of iron (10 to 15 per cent.) in water, applied in winter, with a pretty large brush, to all parts of the branches. This solution destroys all spores of Fungi, but does not seem to injure the bark of the Vines. As a preventive measure, all prunings and dead leaves should be carefully removed from the surface of the soil, lest they might spread infection among the healthy plants in the following spring.

In Saccardo's great work, the "Sylloge Fungorum," many other Fungi are noted as parasitic on Vines, some of which (*Fusarium Zavianum*, *Pionnotes Biasolettiana*, &c.) are occasionally more or less hurtful. Probably one or other of the remedies indicated above would prove suitable against these parasites, as well as against any others that may in future be met with in vineries in Great Britain.

VINE GALLS. Of these, by far the most to be dreaded are the Galls produced on stems and leaves by *Phylloxera vastatrix* (*see* **Grape or Vine Louse**). The only other Galls on Vines in Europe worth mention are pale, hairy growths (*Erineum Vitis*) caused by Mites (*Phytoptus*), in patches on the lower surface of the leaves, and two produced by Gall-midges. Of these, one is a swelling of the twigs, and is the work of an undetermined species of Midge (*Cecidomyia*); it occurs in the South of France, and in the South of Russia. The other produces swellings, not unlike those of *Phylloxera*, on the leaves. They are about $\frac{1}{10}$in. in diameter, conical on the upper surface, and more rounded below. Several grow in each leaf. This Gall has been found in Austria.

The North American Vine Galls are far more varied in size and form than the European, and several of them attain considerable size. All that will be referred to here are the work of Gall-midges (*Cecidomyia*). The "Filbert Gall" is developed from a bud, and forms a mass 1½in. to 2½in. in diameter, made up of from ten to forty woolly, greenish, juicy Galls, each tenanted by one orange-yellow larva. The "Tomato Gall" consists of an irregular mass of juicy, yellowish-green or red swellings, each occupied by four or five larval chambers, with one orange-yellow larva of *Lasioptera Vitis* in each. The whole mass may reach from 1in. to 4in. across.

The "Apple Gall" is attached to the stem, and is like a hazel-nut in form. It is nearly 1in. in diameter. There are eight or nine furrows down the surface, which correspond to chambers in the interior, in an upper and a lower series. Each is occupied by a bright yellow larva of a *Cecidomyia*. The gall is juicy, and the surface is covered with short, downy hairs. The "Trumpet Gall" rises from the upper (rarely the lower) surface of the leaf. As a rule, many stand on each leaf, two or three often being united at the base. These Galls are about ⅛in. long by $\frac{1}{20}$in. broad in the widest part; they taper a little towards the base, and the other end is sharp. Their colour varies from bright red to green.

Remedy. None of the above Galls have yet been recorded from England. Should any of them be introduced with European or American Vines, they should be removed from the plants while still young and soft: no further remedy is needed.

VINEGAR PLANT. When fluids containing sugar in solution are allowed to stand exposed to the atmosphere, their composition undergoes considerable chemical changes in a short time. The microscopic spores of various kinds of Fungi fall into them, germinate, and feed upon the sugar, which they break up into simpler combinations. Carbonic Acid gas is given off; and a quantity of Alcohol is formed at the expense of the sugar. If the fluid is allowed to stand undisturbed for some time, the Alcohol also is attacked, and is changed, by the addition of Oxygen to it, into Vinegar. These changes are accompanied by the formation, on the surface of the fluid, of a tough, slimy layer, usually covering the whole surface, but not extending to a great depth. On examining a portion of the mass, it will be found to form layer on layer, separable from one another, the lower layers hanging in a flocculent web into the fluid. The microscope shows that the mass is made up chiefly of the translucent filaments of a Fungus, consisting of short, rod-like cells, end to end, imbedded in a gelatinous substance. Some of the cells are swollen at intervals. All are very minute; but they are capable of growing and reproducing themselves, if broken off the filaments. Intermixed with these are various other forms of cells, belonging to other kinds of Fungi that grow in the fluid, since many kinds of spores usually fall into it. In fact, it is impossible to obtain an unmixed culture of such small Fungi, except by the exercise of the utmost care. Trustworthy observations and experiments prove that the production of Vinegar from Alcohol goes on only when this mass of Fungus is present (except when artificially effected by chemical agencies); hence the mass is usually known as the Vinegar Plant. Various species of Fungi have been detected in it; but there is reason to believe that the species which effects the formation of Vinegar is a member of the great group of *Bacteria*. It has received various names; those most commonly used are *Mycoderma Aceti*, Pasteur, and *Bacterium Aceti*, Kuetz. It forms the greater part of the Vinegar Plant, and its cells vary greatly in shape, being globular and very minute (*Micrococcus*), or like short rods (*Bacterium* form), or longer rods (*Bacillus* form), or filaments, as described above (*Leptothrix* form), all united by the gelatinous slime into what is often called a *Zooglœa*. Intermixed with the *Mycoderma*, or at times forming separate patches, are the filaments and groups of cells of *Saccharomyces Mycoderma*, a Fungus nearly allied to the Yeast of beer. By some botanists this has been regarded as the active agent in the production of Vinegar. *Mycoderma Aceti* has the power of absorbing Oxygen from the atmosphere, and of effecting its union with the Alcohol to form the Vinegar; and such cells of this Fungus as are in immediate contact with the air can even cause the breaking up of the Vinegar into Carbonic Acid and water, by continuing the process of oxidation. In France, *M. Aceti* is employed in the commercial manufacture of Vinegar. Shavings of wood, covered with the Fungus, are put into solutions containing sugary substances, or Alcohol, such as beer, cider, sap of fruits, wines, brandy, &c. A temperature of from 85deg. to 95deg. Fahr. is found to give the most favourable results, both in rapidity and in amount of production of Vinegar. *Mycoderma Aceti* does not thrive in very acid wines or other solutions, and it generally appears in them only after they have been rendered less acid by the growth in them for some time of *Saccharomyces Mycoderma*. If a Vinegar Plant is allowed to remain on the fluid after it has exhausted the sugars available for its nourishment, the surface becomes covered, after a time, with blue, green, or yellow Moulds (*Penicillium glaucum*, &c.), or other minute Fungi. These were at one time believed to be developed as a further stage of the Vinegar plant itself; but they must be regarded as growing at the expense of the latter, when it is weakened by its food being exhausted.

VINEGAR-TREE. A common name for *Rhus glabra* and *R. typhina*.

VINE, GLORY. A common name for **Clianthus** (which *see*).

VINE, GRANADILLA. *See* **Passiflora quadrangularis.**

VINE, GRAPE-FLOWER. *See* **Wistaria.**

VINE, ICE. A name applied to **Cissampelos Pareira** (which *see*).

VINE, KANGAROO. *See* **Vitis antarctica.**

VINE LOUSE. *See* **Grape or Vine Louse.**

VINE MAPLE. A name given to **Acer circinatum** (which *see*).

VINE, MILK. A name sometimes used for **Periploca græca** (which *see*).

VINE MOTHS. The larvæ of several species of Moths feed on the leaves, twigs, or young fruit of Vines. Some of them are Hawk Moths (*see* **Sphingidæ**), the Elephant Hawk Moths (*Deilephila Elpenor* and *D. Porcellus*) being the commonest. Others belong to the Night Moths (*see* **Noctua**). Of the latter may be specially noted the White-line Dart Moth (*Agrotis Tritici*), the Large Yellow Under-wing Moth (*Triphæna pronuba*), and the Gothic Moth (*Nœnia typica*). All three feed on many plants, the two first-named being almost omnivorous; and all of them destroy the shoots and leaves of Vines, though the larvæ differ a good deal in their habits. Those of *Agrotis Tritici* and of *Triphæna pronuba* hide in the soil by day, but at night they gnaw the young shoots near the ground; and it is thus difficult to detect them. The methods recommended against **Surface Caterpillars** may be employed to lessen their numbers. The larvæ of *Nœnia typica* feed, in autumn, on the upper surface of the leaves of most kinds of fruit-trees, including Vines. The young larvæ live in companies, packed side by side, almost motionless, but eating away the surface membrane of the leaves steadily forward, and leaving brown, dead patches behind them. When about a fortnight old, they drop to the earth, and thereafter feed on low plants, till the cold weather of winter makes them go under shelter till spring, when they resume their life on the low herbage. They are dull brown, with a darker line down the back and one on each side, and a series of oblique, short, white lines along the lower part of each side. It is easy to remove the companies of larvæ by hand-picking, if they are doing injury to the Vines.

Certain of the smaller Moths belonging to the **Tortricina** (which *see*) are extremely destructive in the vineyards of France and Germany; but they are seldom the causes of much harm in British vineries, though they occur sparingly in England. *Œnectra Pilleriana* (called also *Tortrix Pilleriana*) has been the subject of very exhaustive investigation, by Audouin and other French naturalists, under the name "Pyrale de la Vigne." Its larvæ live in rolled Vine leaves, and are very hurtful on the Continent; but the insect is too rare in England to call for a longer notice here. An allied insect (*Eupœcilia ambiguella*) is almost equally hurtful abroad, as the larvæ feed on the flower-buds and on the young grapes, and envelop the clusters in webs, which prevent the growth of the fruit, and promote its early decay. This insect, also, is too rare in England to be dangerous. The fore wings reach a little over ½in. in span; they are ochreous, with a greyish streak along the basal half of the front margin, and a broad, slanting, dark grey bar about the middle of the wing; the head and thorax are ochreous. *Lobesia reliquana* (also called *Tortrix vitisana* and *Grapholitha botrana*) has very similar habits to the last-named species, devouring the flower-buds, and spinning the clusters of young fruit up in webs. In bad attacks, as much as

Vine Moths—*continued.*

half the crop has been lost in this way. This insect has been extremely troublesome in Austria. It is not rare in the South of England, though it has done little mischief in this country as yet. It is a little less than ½in. in span of fore wings, which are chestnut-red, marbled with pale buff, and with two dark brown, white-edged, triangular spots on the hinder margin of each. The change into pupæ occurs in the soil below the Vines. The larvæ may be detected by their webs, and should be removed, either by hand-picking the ravaged clusters, or by shaking or jarring them above a sheet, tarred tray, or any other contrivance for capturing the larvæ shaken off the plants. In the "Gardeners' Chronicle" for Sept. 23, 1882, *Œnectra Pilleriana* and *Lobesia reliquana* are noticed and figured by Professor Westwood; and, in the same newspaper, a month later, still another insect-foe is added: this is *Ditula angustiorana* (also called *Tortrix angustiorana*). The last-named is nearly related to *Lobesia reliquana*, but is larger. The fore wings measure from ½in. to ¾in. in span, being ochreous in the males, and reddish-brown in the females; in both sexes, the wings show a darker patch at the base, a chestnut-brown patch slanting from the middle of the wing to the hinder angle, and darker spots irregularly scattered over the outer half of the wing, the most conspicuous of these being a triangular spot on the front border. The larvæ have been found living on most fruit-trees, as well as on Privet, Hawthorn, and other shrubs; and within the past few years they have been discovered in ripened grapes in English vineries. They also feed on the Vine leaves, but not in such numbers as to seriously injure the plants in this way. Though abundant in many parts of England, *Ditula angustiorana* usually feeds on a variety of food-plants in preference to Vines.

Among the *Tineina* (*see* **Moths**) there are few species that are dangerous to Vines. Of one small Moth (*Antispila Pfeifferella*) the larvæ, which usually feed on the leaves of Dogwood, sometimes mine in the Vine leaves, and, when about to become pupæ, form flat cases composed of two pieces cut out of the leaves, and attach them to the leaves or branches. The pupæ lie protected in the cases till the emergence of the Moths. The fore-wings of the latter reach only about ⅓in. in span; they are brown, with a coppery or golden gloss, and near the middle they are crossed by two narrow, yellow bands, the outer of which is broken in the middle. The injury done to the leaves by this species is seldom noticeable, though the Moth is not rare in England.

Treatment. This varies with the habits of the larvæ that are doing the harm. Hand-picking is a sufficient remedy against the larvæ of Hawk Moths, and the groups of larvæ of *Nœnia typica*. It is the only efficient method against Leaf-miners, such as *Antispila*; and it must also be resorted to against the larvæ of *Tortricina*, which live inside the young or ripe fruits, or in the clusters, inclosed in webs. The larvæ, and the leaves or grapes in which they live, should be destroyed, not merely thrown on the ground. Hand-picking is also of use where the eggs (*e.g.*, of *Œnectra Pilleriana*) are placed in clusters on the leaves. Those larvæ that conceal themselves in the soil by day, and emerge from their concealment by night to feed on the shoots and leaves, or that gnaw the bark of the stems and roots, should be combated as recommended under **Surface Caterpillars.** Such larvæ as live in rolled leaves may be collected in sheets or trays laid below the branches, which should be shaken or jarred, to cause the larvæ to drop from their concealment. The larvæ of some of the *Tortricina* that injure the Vines and fruits, pass the winter under the loose bark on the stems, and emerge, when the weather becomes milder, to devour the buds, young leaves, and flowers. The pupæ of some are protected during winter in similar retreats. It is, therefore, desirable to remove

Vine Moths—*continued.*

all loose bark, and this can be done in winter by means of a brush of stiff fibres, *e.g.*, of piassaba. All dead leaves and rubbish should also be removed from the surface of the soil, and either consigned to the compost-heap or burned. In the continental vineyards, the Moths are trapped by fires, or by shallow dishes of water, into which they fly. A solution of potassic sulphate (1 per cent.), sprayed over the flower-buds about the time the first brood of Moths is on the wing, and over the young fruits when the second brood is ready for egg-laying, has been found to materially lessen the injury to the crop.

VINE, MOUNTAIN. *See* **Viola tricolor lutea.**

VINE, PEPPER. A common name for **Ampelopsis bipinnata** (which *see*).

VINE, PIPE. A common name for **Aristolochia Sipho** (which *see*).

VINE, POISON. A name frequently applied to **Rhus Toxicodendron** (which *see*).

VINE, POTATO. A common name for **Ipomæa pandurata** (which *see*).

VINERY. *See* **Vine.**

VINE SCALE INSECTS. Though occurring in France and in Germany, these insects are not native in Britain. The one most frequently found on Vines is *Lecanium Vitis*, also called *Coccus Vitis*. The female is covered with an oval, convex scale, which is a little narrowed in front; the colour is reddish-brown, with black dots; the shield is bordered by the white, cottony secretion in which the red eggs are embedded. The male insects are very small; they are brick-red, with black thorax, brown antennæ, and two transparent wings, each with a thickened and red front border; the body ends in two long bristles. This insect lives on the old stems of Vines, preferring such as are sickly; and it occurs either singly or in groups.

Mytilaspis Vitis is another Vine Scale, met with in Germany. It is very like the **Apple Mussel Scale** (which *see*), and has usually been mistaken for it; but the two species differ in certain minute characteristics. The larvæ live on the young twigs near the buds; and the spots on which they are placed become brown or blackish. The females live on the twigs of the second year's growth.

Remedies are detailed under **Scale Insects.** The branches and stems must be well cleansed from the Scales, by means of a stiff brush and strong lye of wood-ashes, or solution of kerosene or carbolic acid. Good manure should afterwards be applied to the roots.

VINE, SILK. *See* **Periploca græca.**

VINE, SILVER. A popular name for **Scindapsus argyrea** (which *see*).

VINE SLUG. The name popularly given, in North America, to the larva of the Grape-vine Sawfly (*Selandria Vitis*), which occasionally almost strips the leaves off the Vines in vineyards in the United States. The perfect insect has four wings, which are smoky-brown, but semi-transparent, with brown veins. The thorax is red, the rest of the body black, and the fore legs and lower side of the other legs pale yellow or whitish. The female is ¼in. long, the male rather shorter. The females lay their eggs in small clusters on the lower surface of the leaves at the tips of the shoots, in the spring and early summer. The larvæ feed side by side, in groups of fifteen to twenty. Beginning at the edge of a leaf, they eat inwards, with great regularity of rank, till they reach the leafstalk; then they eat the next lower leaf, and so on down the shoot. The full-fed larvæ are a little more than ½in. long, and are thickest a little behind the head, thence tapering

Vine Slug—*continued.*

backwards. They are pale yellow, with darker or greenish backs. Each ring bears two cross rows of minute, black dots The head and the tip of the last segment are black. At the last moult they become entirely yellow, and, crawling down to the soil, burrow into it, and form small, oval, earthen cocoons. In a fortnight, the autumn brood of Sawflies emerges, and from their eggs a new brood of larvæ is hatched.

Remedies. These insects have not been found in Europe, but may be brought from America with Vines. If introduced, the infested Vines should be sprinkled with Hellebore powder (½oz. in 1 gal. of water) or Paris Green (half-a-teaspoonful in 1 gal. of water).

VINE, WATER. A common name for **Phytocrene** (which *see*).

VINE WEEVILS. Several species of the great group of Weevils are hurtful to the young twigs and leaves of Vines. They are hence sometimes distinguished as Vine Weevils; but this name is rather misleading, as they are all hurtful also to many other cultivated plants. They belong to the genera *Otiorhynchus* and *Rhynchites.* The species of most frequent occurrence on Vines are: *O. Ligustici*, black, with greyish scales; *O. picipes* (Clay-coloured Vine Weevil), of a brown or earthy colour, sometimes approaching clay-yellow; *O. sulcatus*, black or dark brown, with tufts of grey hairs on the wing-cases; and *R. betuleti*, shining blue or green, and hairless. A full account of these insects, and of the appropriate remedies against them, will be found under **Otiorhynchus** and **Rhynchites.**

VINE, WONGA-WONGA. A common name for **Tecoma australis** (which *see*).

VINEYARD CANE. A common name for **Arundo Donax** (which *see*).

VIOLA (the old Latin name used by Virgil, &c., akin to the Greek *Ion*). Heartsease; Pansy; Violet. Including *Erpetion.* ORD. *Violarieæ.* A large genus (about 100 species) of mostly hardy, perennial herbs, rarely suffrutescent; nearly sixty are found in North temperate regions (seven in Britain), about thirty in South America, two in South or East Africa, and eight in Australia or New Zealand. Flowers often cleistogamous (except in the group of which *V. tricolor* may be taken as a representative)—the large-petaled ones appear first, and often yield no seed; the small-petaled, or apetalous ones, appear late, and are prolific—sepals sub-equal, produced at the base; petals spreading, the lower ones often larger, spurred or saccate at base; anthers connate, the connectives of the two lower ones often spurred at the base; peduncles axillary, one or rarely two-flowered. Leaves alternate; stipules persistent, often leaf-like. Of the large number of species introduced, the best-known are here described; they are mostly dwarf plants—seldom exceeding 6in. in height—adapted for planting on rockwork, in flower borders, and, if sufficiently plentiful, in wild gardens, &c. Some of the species are very dwarf and compact in habit: these should, therefore, particularly if scarce, only be planted in select places where they can receive proper attention. The species may generally be propagated by seeds, by runners, or by divisions.

The numerous varieties of bedding Violas and Pansies are popular and well-known plants, valuable for spring and summer bedding, for mixed borders, and for many other situations; they flower in the greatest profusion, and over a lengthened period, if the weather is not too hot and dry for their well-being. Seedlings may easily be raised, but varieties must be perpetuated by cuttings or by divisions. The treatment recommended under **Pansy** is also applicable to the bedding Violas.

Viola—*continued.*

Varieties. The following is a selection of floriferous varieties. Perhaps many others are equally as good as those here named.

ALPHA, bluish-purple. BLUE BELL, violet, shaded blue; very floriferous. CANARY, yellow; fine. CRITERION, violet; free. DICKSON'S GOLDEN GEM, golden-yellow; very free. GRIEVEI, yellow. HOLYROOD, indigo-blue; fine. LILACINA, rich lilac. PILRIG PARK, pure white; large and good. ROYAL VISIT, violet self. SNOWDROP, waxy-white. THE TORY, plum-colour; one of the best.

SWEET VIOLETS (*Viola odorata*). Of these there are several varieties cultivated in gardens, and few flowers are more generally liked, particularly through the winter and spring months. To insure a supply at these periods, a special system of culture must be practised, and frames must be available. Stock plants may be divided—those similarly treated the previous year are preferable—into as many young single crowns as they admit, in April or May, and all the old crowns should be thrown away, unless required for propagating only. The selected crowns should be planted in good ground, and in an open situation, about 9in. apart, allowing 12in. between the rows. A position where Violets generally succeed in summer is a north or north-west border, but much depends on local circumstances and the nature of the soil, whether light or heavy; if light, the north border should be selected, as it would be cooler than elsewhere, and the plants would be less liable to the attacks of Red Spider, which is their greatest enemy. Attention to cleaning, lightly hoeing the surface soil, and watering, if necessary, are important details of summer management. Mulching with spent mushroom beds, or other short manure, is of great advantage if the summer be hot; it keeps the soil cool, and tends to prevent undue evaporation. Syringing, or sprinkling with water from a can, in the evenings, after dry days, is recommended, and most of the young runners which will appear should be cut away when small. Some cultivators save about three runners on each plant, and peg them down; these root and flower well during winter with the parent, and make excellent stock plants for the next year. Towards the middle or end of September, the frames, or pits, should be prepared, and the best specimens lifted and planted in them just close enough to occupy all the space without overcrowding. The frames should have a south aspect, and should be partially filled with well-prepared stable litter and leaves. About 6in. of soil is necessary for planting in, and this should be brought up as near the glass as the foliage will allow, so that full exposure to light and sunshine in winter will be assured. Give a thorough watering, and keep the frames rather close for about a week after planting; plenty of air may then be admitted, on all favourable opportunities, all through the winter, the sashes being entirely removed during sunshine and when there is no frost, and also in very mild weather. Foggy weather is injurious to Violets in frames: it causes damping amongst the leaves, and prevents proper development of the flowers. Marie Louise is one of the best of all Violets for frame culture when treated as described; Comte Brazza and the old Neapolitan are also excellent. The Neapolitan does not generally grow so freely as Marie Louise, and is later in flowering. These three double-flowered varieties are general favourites for frames.

Varieties. There are several varieties, both double and single-flowered; the following selection comprises most of the best:

ARGENTÆFLORA, purplish-white, very fragrant. COMTE BRAZZA, white, double, sweet-scented; extra good. CZAR, blue, single, large, and produced in great profusion. MARIE LOUISE, lavender-blue and white, very large flowers, sweet-scented; very floriferous, extra fine. NEAPOLITAN, pale lavender; an old and well-known double variety, very sweet-scented. ODORATA ALBA, white, single; dwarf and distinct. QUEEN OF VIOLETS, white, flushed with pink, double. RUSSIAN, blue, single, large, very free; an old variety. VICTORIA REGINA, blue, double, large, fragrant. WHITE CZAR, a white form of Czar.

Viola—*continued.*

V. altaica (Altaian). *fl.* yellow, large; sepals acute, denticulate; spur scarcely as long as the appendages of the sepals; stigma urceolate. March to June. *l.* oval; stipules cuneate, with acute teeth. Stem short. Root creeping, slender, hard. Altaian Mountains, 1805. (B. M. 1776; B. R. 54; R. G. 1071.)

V. arenaria (sand-loving.) *fl.* pale blue, on short, axillary branches from a compact rosette; sepals acute; petals broad; spur short. May and June. *l.* orbicular-ovate, obtuse. Europe (Britain), &c. Plant small, tufted, pubescent, 2in. to 6in. in diameter. (Sy. En. B. 174 *bis.*)

V. biflora (two-flowered). *fl.* yellow, the lip streaked with black, small; sepals linear; petals smooth; spur very short; stigma bifid. April and May. *l.* reniform, serrated, smooth; stipules ovate. Stem erect, about two-flowered. Roots creeping. Europe, Siberia, &c., 1752. (B. M. 2089; F. D. 46.)

V. blanda (charming). *fl.* white, small, faintly sweet-scented; petals mostly beardless, the lateral ones veined with lilac; spur short. Early spring. *l.* round-cordate or reniform, minutely pubescent. Rootstock creeping. North America, 1802.

V. calcarata (spurred). *fl.* blue or white; sepals oblong, glandularly denticulate; spur awl-shaped, longer than the calyx. March to July. *l.* spathulate-roundish or elongated, crenate; stipules palmatifid or trifid. Stems short, simple, tufted. Root fibrous, diffuse. Austria, 1752. A very variable species.

V. c. albiflora (white-flowered). *fl.* white, large. *l.*, stipules cut, scarcely ciliated. Stem short. (R. G. 1028.)

V. c. Halleri (Haller's). *fl.* blue, large. Otherwise like *V. c. albiflora.* (R. G. 1028.)

V. canadensis (Canadian). *fl.*, petals white or whitish inside, the upper ones mostly tinged with violet beneath, the lateral ones bearded; spur very short; stigma beakless. May to August. *l.* cordate, pointed, serrated; stipules ovate-lanceolate, entire. *h.* 1ft. to 2ft. North America, 1783. (S. B. F. G. ser. ii. 62.)

V. canina (canine). Dog Violet. *fl.* blue, lilac, grey, or white, ½in. to 1¼in. in diameter; sepals narrow, acuminate; spur obtuse; style clavate, hooked. April to August. *l.* long-petiolate, crenate-serrate, narrow ovate-cordate. Europe (Britain), &c. Very variable in size, habit, and colour of flower. (F. D. 2646.)

V. c. lactea (milky). *fl.* grey; petals narrow, the spur very short. *l.* ovate-lanceolate, rounded or cuneate at base. Rootstock short, without runners. Plant very slender. (Sy. En. B. 176, under name of *V. lactea.*)

V. c. persicæfolia (Peach-leaved). *fl.* pale lilac or white; spur very short. *l.* oblong-lanceolate, truncate at base; upper ones narrower. Rootstock long, with runners.

V. capillaris (capillary). *fl.* pale blue; lateral petals densely bearded; spur short, obtuse, greenish; pedicels axillary, solitary, slender, four to six times as long as the leaves. May to August. *l.* petiolate, ovate or ovate-oblong, ¼in. to ⅔in. long, obtuse at base, cuneate-decurrent, slightly acute at apex, the margins remotely glandular-serrated. Stems many, tufted, decumbent, leafy. Chili. (F. d. S. 983.)

FIG. 195. VIOLA CORNUTA.

V. cornuta (horned).* *fl.* pale blue; sepals awl-shaped; spur awl-shaped, elongated and abrupt at the base. May to July. *l.* cordate-ovate, crenate, ciliated; stipules obliquely cordate, toothed, ciliated. Stems ascending, diffuse. Root fibrous. Switzerland and Pyrenees, 1776. Plant tufted. See Figs. 195 and 196. (B. M. 791.) B. H. 1871, 9, represents one of the numerous large-flowered garden forms, called PERFECTION.

V. cucullata (hooded).* *fl.* deep or pale violet-blue or purple, sometimes nearly white or variegated with white; lateral, and often the lower, petals bearded; spur short and thick; stigma slightly beaked or beakless; scapes 3in. to 10in. high. Early spring. *l.* long-petiolate, erect, cordate, with a broad sinus, varying to reniform and dilated-triangular, smooth or more or less pubescent, the sides at the base rolled inwards when young, obtusely serrated. Rootstocks thickly toothed. North America, 1762. A very variable species. See Fig. 197. (B. M. 1795; S. B. F. G. ser. ii. 298.) There is a variegated form in cultivation.

Viola—*continued.*

V. c. palmata (palmate-leaved). *l.* variously three to seven-cleft or parted, or the earlier ones entire on the same plant. (B. M. 535, under name of *V. palmata.*)

V. dentata (toothed). A synonym of *V. sagittata.*

V. eriocarpa (woolly-fruited). A form of *V. pubescens.*

V. flabellata (fan-like). A synonym of *V. pedata.*

V. flabellifolia (fan-leaved). A synonym of *V. pedata.*

FIG. 196. FLOWERS OF VIOLA CORNUTA.

V. hederacea (Ivy-like).* *fl.* blue, rarely white, usually small, but sometimes ⅔in. broad; petals glabrous, or the lateral ones slightly pubescent inside; spur reduced to a slight concavity. July. *l.* reniform, orbicular, or spathulate, usually less than ½in., but in very luxuriant specimens 1in. to 1½in., broad, entire or toothed. Australia, 1823. Plant tufted, half-hardy. (H. E. F. iii. 225; L. B. C. 1133.) SYNS. *Erpetion hederaceum, E. reniforme* (S. B. F. G. 170).

V. hirta (hairy). *fl.* inodorous or faintly scented; spur long and hooked; bracts lower on the peduncle; anther spurs lanceolate. April to June. *l.* narrower and more triangular, with deeper crenatures and a shallower sinus; hairs of petiole more spreading. Otherwise like *V. odorata.* Europe (Britain), &c. (Sy. En. B. 172.)

V. lactea (milky). A form of *V. canina.*

V. lanceolata (lance-leaved). *fl.* white, small; petals beardless, the lower ones veined with lilac. Early spring. *l.* lanceolate, erect, blunt, tapering into a long-margined petiole, almost entire. Rootstock creeping. North America, 1759. (L. B. C. 211; S. B. F. G. 174.)

V. montana (mountain-loving). *fl.* white, at length bluish; spur conical, truncate, straight, greenish, shorter than the sepals; stigma papillose, slightly reflexed. May to July. *l.*, lower ones cordate, upper ones ovate, acute; petioles margined; stipules oblong, toothed or incised. Stem simple, erect. *h.* 1ft. Europe and Siberia, 1683. (B. M. 1595.)

V. m. Ruppii (Ruppius'). *l.* cordate or lanceolate. Stems procumbent. (A. F. P. iii. 25 and L. B. C. 686, under name of *V. Ruppii.*)

V. Munbyana (Munby's).* *fl.* violet or yellow, large, one to three from the lower axils; spur straight, nearly twice exceeding the calyx; peduncle erect, long-exceeding the leaves. Spring. *l.* ovate-cordate, obtuse, obtusely crenate, glabrous, or the margins slightly ciliated. Stems procumbent. Algiers. A pretty species. *lutea* is a yellow-flowered form.

V. odorata (odorous).* Sweet Violet. *fl.* blue, white, or red-purple, fragrant; lateral petals with or without a tuft of hairs; spur nearly straight, short, obtuse; anther spurs linear-oblong; style hooked; stigma oblique; bracts about the middle of the peduncle. March to May. *l.* deeply cordate at base, the sinus closed; stipules glandular; petioles deflexed-hairy. Rootstock short, scarred, with very long runners. Europe (Britain), &c. (B. M. Pl. 25; Sy. En. B. 171.)

V. o. alba (white). *fl.* white.

V. o. pallida-plena (pale double). Neapolitan Violet. *fl.* pale lavender, double, very sweet-scented.

V. o. permixta (confused). *fl.* pale, scentless. Runners not rooting.

V. o. sepincola (hedge-loving). *fl.* dark, scentless. Runners rooting. More hairy than the type

Viola—*continued.*

V. palmata (palmate). A variety of *V. cucullata.*

V. palustris (marsh-loving). *fl.* white or lilac, ½in. in diameter, scentless; sepals obtuse; lateral petals almost glabrous; spur short, obtuse; stigma obliquely truncate. April to July. *l.* cordate-reniform, slightly crenate, enlarging after flowering; stipules glandular. Rootstock white, scaly, subterranean, creeping; runners short, leafless. Europe (Britain), &c. (Sy. En. B. 170.)

V. pedata (pedate-leaved).* *fl.* usually bright blue, sometimes pale or even white, very large; petals all glabrous, the spur very short: stigma large and thick, margined, obliquely truncate. May and June. *l.* pedately about seven-parted, firm; leaflets linear-lanceolate, entire or incisely three-toothed at the summit, sometimes very narrow and laciniate; stipules ciliated. Rhizome thick. North America, 1759. See Fig. 198. (A. B. R. 153; B. M. 89; F. M. 350; L. B. C. 536; S. B. F. G. 69). Syns. *V. flabellifolia* (L. B. C. 777), *V. flabellata* (S. B. F. G. ser. ii. 247).

V. p. atropurpurea (dark purple). *fl.* dark purple; pistil pubescent. *l.*, segments cuneate, incised. (F. d. S. 1361; R. G. 1110, f. a.)

V. p. bicolor (two-coloured).* A very handsome variety, with the two upper petals deep violet, and, as it were, velvety, like a Pansy.

V. pedunculata (pedunculate).* *fl.* deep yellow, large; petals broadly obovate, the two upper ones with conspicuous claws, the lateral ones bearded at the base; spur very short; peduncles twice or thrice as long as the leaves. Spring. *l.* rhombic-ovate, scarcely 1in. long, rather thick, coarsely and obtusely toothed, to four-leaved above. *h.* 6in. to 12in. North America, 1772. Plant softly pubescent. (L. B. C. 1249; S. B. F. G. 223.)

V. p. eriocarpa (woolly-fruited). A stout and more pubescent variety, 1ft. to 2ft. high, with woolly pods. (B. R. 390; S. B. F. G. 102, under name of *V. eriocarpa.*)

V. pyrolæfolia (Pyrola-leaved). *fl.* yellow: sepals acuminate; petals densely bearded within; spur short, obtuse; stamens emarginate at apex. January. *l.* ovate, sometimes loosely cordate; stipules fringed at apex. Patagonia, 1851. (F. d. S. 665.)

V. Riviniana (Rivinus'). A form of *V. sylvatica.*

V. rothomagensis (Rouen).* *fl.* bright blue, the side petals and lip striped with black; spur tubular, obtuse, shorter than the sepals; bracts near the flower, lanceolate, with a tooth on each

Viola—*continued.*

abruptly narrowed at base. California, 1856. Half-hardy. (B. M. 5004; F. d. S. 2426.)

V. præmorsa (bitten). *fl.* yellow, rather large; lower petal veined with brown, emarginate; spur very short; peduncles mostly shorter than the leaves. Spring. *l.* ovate-lanceolate, repandly denticulate or nearly entire; stipules entire. Stems erect, short. North America, 1828. Plant usually densely hirsute. (B. R. 1254.)

V. pubescens (downy). *fl.* yellow, the lower petals veined with purple; spur extremely short. Spring and early summer. *l.* very broadly cordate, toothed, somewhat pointed; stipules large, ovate or ovate-lanceolate. Stems simple, erect, naked below, two

FIG. 197. LEAVES AND FLOWERS OF VIOLA CUCULLATA.

Viola—*continued.*

side. April to August. *l.* ovate, the lower ones somewhat cordate, crenate, fringed; stipules pinnatifid, rather lyrate. Stems zigzag, branched, diffuse. Root rather fusiform. France and Belgium, 1781. Plant hispid or pilose. (B. M. 1498.)

V. rotundifolia (round-leaved). *fl.* yellow; lateral petals bearded and marked with brown lines; spur very short. Early spring. *l.* round-ovate, cordate, slightly crenate, ⅔in. broad at flowering time, increasing in the summer to 3in. or 4in., then lying flat on the ground, shining above. Rootstock creeping. North America, 1800.

V. Ruppii (Ruppius'). A variety of *V. montana.*

V. sagittata (arrow-leaved). *fl.* purple-blue, rather large; lateral, or occasionally all, petals bearded; spur short and thick; stigma beaked. Spring and early summer. *l.* on small and margined, or the later ones on naked, petioles, varying from oblong-cordate to hastate, sagittate, oblong-lanceolate, or ovate, denticulate, sometimes cut-toothed near the base. North America, 1775. Plant smoothish or hairy. (L. B. C. 1471.) SYN. *V. dentata* (L. B. C. 1485).

V. s. emarginata (emarginate). *fl.*, petals emarginate or bidentate. *l.* almost triangular, lacerate-toothed near the base.

V. Selkirkii (Selkirk's). *fl.* pale violet; spur very large, almost as long as the petals, thickened at the end. Spring and early summer. *l.* round-cordate, crenate, ½in. to 1¼in. long, minutely hairy above, and having a deep, narrow sinus; petioles (and scapes) 1in. to 2in. long. Rootstock filiform, fibrous-rooted. North America, 1873. A small and delicate plant. (R. G. 752.) SYN. *V. umbrosa.*

V. striata (striated). *fl.* cream-coloured or white; lateral petals bearded, the lower ones striped with purplish lines; spur rather thick, much shorter than the petals; stigma beaked. April to October. *l.* cordate, finely serrated, often acute; stipules large, oblong-lanceolate, strongly fringed-toothed. Stems angular, ascending, 6in. to 10in. high. North America, 1772.

V. suavis (sweet). Russian Violet. *fl.* pale blue, white at the base, sweet-scented; sepals obtuse; four upper petals narrowest, the lower one emarginate, the two lateral ones with a hairy line; stigma hooked, naked. March to May. *l.* reniform-cordate, crenate, pubescent. Stolons long, creeping and rooting. Tauria, 1820. (S. B. F. G. ser. ii. 126.)

FIG. 198. VIOLA PEDATA.

V. sylvatica (sylvan). Wood Violet. *fl.* bluish-purple or lilac, on axillary branches from a radical rosette; base of sepals much produced in fruit; spur short, broad, compressed, furrowed, usually pale. March to July. *l.* broadly ovate-cordate; stipules lanceolate, acute, fimbriated or toothed. Rootstock short. Europe (Britain). Plant glabrous.

V. s. Reichenbachiana (Reichenbach's). *fl.* paler, smaller, and earlier than in the species; spur longer; sepals scarcely produced in fruit. (Sy. En. B. 174.)

V. s. Riviniana (Rivinus').* *fl.* bluish-purple or lilac, scentless, ⅝in. to 1in. across; petals obovate-oblong, the lowest much broader than the others; peduncles long, with two small bracts. Late summer. *l.*, lower ones as broad as (or broader than) long; upper ones a little narrower than long. (Sy. En. B. 173, under name of *V. Riviniana.*)

V. tricolor (three-coloured).* Heartease; Pansy. *fl.* ½in. to 1¼in. in diameter; sepals with large auricles; petals purple, whitish, or golden-yellow, sometimes particoloured; stigma capitate, excavated. May to September. *l.* long-petiolate, ovate-oblong or lanceolate, 1in. to 1½in. long, lyrate, coarsely and remotely crenate-serrate; stipules ¼in. to ½in. broad. Stem 4in. to 18in. long, branched, erect or ascending, angular, flexuous.

FIG. 199. VIOLA TRICOLOR.

Rootstock none. Europe (Britain), &c. See Fig. 199. (Sy. En. B. 178.) In addition to the two most popular names above mentioned, the following are applied to this species: Call-me-to-you, Fancy, Flamy, Garden Gate, Herb Trinity, Jump-up-and-kiss-me, Kiss-me, Kiss-me-at-the-garden-gate, Live-in-idleness, Love-in-idleness, Pink-of-my-John, Three-faces-under-a-hood, Tickle-my-fancy.

V. t. arvensis (field-loving). *fl.* white or yellowish; petals usually shorter than the sepals, or wanting. Stem elongated, branched. (Sy. En. B. 179.)

V. t. Curtisii (Curtis'). *fl.* blue, purple, or yellow; petals spreading, rather longer than the sepals. Rootstock branched, stoloniferous, tufted. (Sy. En. B. 180.)

V. t. lutea (yellow). Mountain Vine. *fl.* blue, purple, or yellow; petals spreading, much longer than the sepals. Rootstock branched. Branches slender, with short stems and underground runners. (Sy. En. B. 181.)

V. umbrosa (shade-loving). A synonym of *V. Selkirkii.*

V. variegata (variegated-leaved). *fl.* pale violet; spur cylindrical, straight, as long as the sepals. May and June. *l.* cordate-ovate or roundish, violaceous below, obscurely green above, white at the veins, and rather hispid (in fruit-bearing plants large and almost glabrous); stipules lanceolate, denticulated. Root rather hard, sub-divided. Dahuria, 1817. (R. G. 1852, 20.)

VIOLACEOUS. Violet-coloured.

VIOLARIEÆ. A natural order of broadly-dispersed herbs or shrubs, the former plentiful in temperate regions, the latter more numerous in the tropics. Flowers hermaphrodite, rarely polygamous, axillary, solitary or in cymes, racemes, or panicles; sepals five, imbricated, rarely persistent; petals five, hypogynous or slightly perigynous, unequal or sub-equal, imbricated, often twisted; perfect stamens five; anthers erect; pedicels usually bibracteolate. Fruit a capsule, often opening elastically by as many seed-bearing valves as there are placentas; or an indehiscent berry. Leaves alternate or rarely opposite, simple, entire or rarely laciniate; stipules leafy or small, in the shrubby species generally deciduous. The order embraces twenty-one genera, and about 240 species, many of which are well known in gardens. Examples: *Hymenanthera, Sauvagesia, Viola.*

VIOLET. *See* **Viola.**

VIOLET, ADDER'S. A name applied to **Goodyera pubescens** (which *see*).

VIOLET, BOG. A name given to the species of *Pinguicula.*

VIOLET, CANATHIAN. A common name for **Gentiana Pneumonanthe** (which *see*).

VIOLET, CAPE. A name frequently applied to **Ionidium capense** (which *see*).

VIOLET, CORN. *See* **Specularia hybrida.**

VIOLET, DAME'S. *See* **Hesperis matronalis.**

VIOLET, DOG. *See* **Viola canina.**

VIOLET, DOG'S-TOOTH. *See* **Erythronium dens-canis.**

VIOLET, FALSE. A common name for *Dalibarda repens* (now included under *Rubus* as *R. Dalibarda*).

VIOLET, FOREIGN. *See* **Schweiggera.**

VIOLET, FRINGED. *See* **Thysanotus.**

VIOLET FUNGI. Violets are liable to the attacks of several species of Fungi, which grow on the stems and leaves, and on the sepals and petals of the flowers.

Urocystis Violæ causes the stems and leaves of *Viola odorata*, and of other Violets, to become greatly thickened and distorted. After a time, the epiderm on the swellings is torn here and there, and displays the dark masses of spores. Each spore consists of a large central cell (which, on germinating, forms a slender mycelium tube), and an outer layer or coat of smaller cells.

Puccinia Violæ is of very frequent occurrence on the leaves and petioles of many Violets, including the common wild species and most of the cultivated ones. It appears, in early summer, in the form of Cluster Cups (*Æcidium Violæ*), and is then easily recognisable by the small, yellow cups thickly dotted over reddish-orange, swollen patches. Each cup has a nearly white margin of little teeth, formed by the torn edges of the burst outer coat (peridium), which incloses a multitude of minute, orange-yellow spores. Afterwards, the cups are replaced by small, brown, powdery masses, irregularly scattered, or in circles, composed of rounded or oval, prickly, brown, one-celled, stalked spores, and of the true *Puccinia* spores, each on a rather long stalk, brown, and made up of two cells end to end.

Another *Puccinia* that grows on Violets is *P. ægra*. This species greatly weakens or kills *V. cornuta*, and has also been found on *V. lutea*. Its *Æcidium* has been named *Æ. depauperans*, from its weakening (or depauperating) effect on the host-plants. It may be distinguished from *Æ. Violæ* by the cups being scattered, and not grouped on thickened spots. The two also differ in microscopic peculiarities of their spores.

Puccinia Fergussoni grows on the leaf-stalks and leaves of *V. palustris*, producing thickenings of the tissues, overgrown by the brown, two-celled spores. This Fungus is not known to have more than this single form of spore.

Not unfrequently, the leaves of Violets show discoloured spots, which, on examination with the microscope, are found to be due to the presence of species of *Ramularia* (*R. agrestis* and *R. lactea*), or of *Cercospora* (*C. Violæ*), &c. These are minute Moulds, and bear elongated, multicellular, transparent or brown spores, on the tips of slender stalks. Or such spots may be dotted over with the small, dark perithecia of *Læstadia Violæ*, one of the *Sphæriaceæ*, which has eight oval, unicellular spores in each ascus.

Of all the Fungi that occur on Violets, the most destructive are *Puccinia ægra*, *P. Violæ*, and *Urocystis Violæ*; though the others also may cause considerable disfigurement. These all grow within the tissues of the plants, the only parts pushed to the surface being the organs of reproduction. It is therefore of little use to attempt to cure diseased plants, the interior of which must be full of the Fungi; and it is advisable to remove and burn the plants, to prevent the spread of disease to previously healthy specimens.

VIOLET, MERCURY'S. An old name for *Campanula Medium*.

VIOLET, SPURLESS. *See* **Erpetion hederacea.**

VIOLET, TONGUE. A common name for **Schweiggeria** (which *see*).

VIOLET, WATER. *See* **Hottonia palustris.**

VIORNA. *See* **Clematis Viorna.**

VIPER GOURD. *See* **Trichosanthes anguina.**

VIPER'S BUGLOSS. *See* **Echium.**

VIPER'S GRASS. *See* **Scorzonera hispanica.**

VIRAYA. A synonym of **Waitzia** (which *see*).

VIREYA. Included under *Rhododendron*.

VIRGATE. Twiggy; producing many weak branches; wand-shaped; slender, straight, and erect.

VIRGILIA (named in honour of the poet Virgil). ORD. *Leguminosæ*. A monotypic genus. The species is a greenhouse tree, requiring culture similar to that recommended for **Viminaria.**

V. capensis (Cape). *fl.* rosy-purple, ½in. long; calyx silky, widely campanulate, shortly two-lipped; standard orbicular, strongly reflexed; racemes lateral, longer than the leaves, many-flowered. July. *l.* six to ten-jugate, exstipulate; leaflets linear-oblong, mucronate, nearly 1in. long, with slightly revolute margins, the young ones silky on both sides, the old ones glabrous and glossy above. South Africa, 1767. (B. M. 1590.) SYN. *Podalyria capensis* (A. B. R. 347).

V. lutea (yellow). A synonym of *Cladrastis tinctoria*.

VIRGINIAN COWSLIP. *See* **Mertensia virginica.**

VIRGINIAN CREEPER. *See* **Ampelopsis quinquefolia.**

VIRGINIAN DATE PALM. *See* **Diospyros virginiana.**

VIRGINIAN SILK. A common name for **Periploca græca** (which *see*).

VIRGINIAN STOCK. *See* **Malcolmia maritima.**

VIRGIN'S BOWER. *See* **Clematis.**

VIRGULARIA A synonym of **Gerardia** (which *see*).

VIRIDESCENT. Greenish; turning green.

VIROLA. Included under *Myristica*.

VISCARIA. Included under **Lychnis** (which *see*).

VISCID, VISCOUS. Clammy; sticky from a tenacious coating or secretion.

VISCUM (the old Latin name used by Virgil and Pliny, akin to the Greek *Ixos*). Mistletoe. ORD. *Loranthaceæ*. A genus comprising nearly thirty species of stove, greenhouse, or hardy shrubs, parasitic on trees, inhabiting the temperate and warmer regions of the globe. Flowers dicœcious or moncœcious, at the axils or nodes, or at the tips of the branches, three to five in a fascicle or rarely solitary, the fascicles sessile or rarely on short peduncles; perianth tube in the male flowers very short and solid, in the females adnate with the ovary, the limb three or four-parted; bracts often small. Berry one-seeded, naked or crowned with the perianth. Leaves sometimes flat and rather thick, sometimes reduced to minute teeth or scales. *V. album*, the common Mistletoe, has been associated with many superstitions from the most ancient times, and has been highly extolled for its medicinal virtues. It is, however, now excluded from the Pharmacopœias. "The origin of the modern custom connected with Mistletoe is not very clear. Like many other customs, its original significance is only guessed at. If known, perhaps the innocent merriment now associated

Viscum—*continued.*

with the plant would be exchanged for a feeling of stern disapproval, and the Mistletoe would be banished from our homes. . . . Mistletoe may be made to grow on the Apple and other trees, by cutting a notch in the bark on the under-surface of a branch, and carefully inserting the seed therein. Two precautions are especially needed—one is to place the seed in such a position that the embryo shall be directed towards the trunk of the tree, and the other is to avoid crushing the seed. The Apple is the tree on which the Mistletoe grows most abundantly. The orchards in Herefordshire are greatly infested with this parasite, which, however, has a value of its own, for it appears that upwards of one hundred tons of Mistletoe are annually forwarded to London and other large towns from that county alone, for Christmas decorations. Some sorts of Apples are preferred to others for its growth, and, singularly enough, it is rarely, if ever, found on the Pear-tree. Next in frequency to the Apple, the Mistletoe prefers the Poplars, though it is not found on the Lombardy Poplar. Hawthorns, Limes, Maples, and the Mountain Ash, are all favourite habitats for the plant. It has been found on the Cedar of Lebanon and on the Larch, but rarely upon the Oak. Dr. Bull, in a paper in the 'Journal of Botany' (ii. 73), only mentions seven authentic instances of the growth of Mistletoe on the Oak in this country" (Dr. Masters). The ripe fruits may be crushed on young branches of Apple or Thorn trees, and the viscid pulp soon hardens and affords protection to the seed, as well as sufficient resistance to allow it, when germinating, to pierce the bark. To prevent birds from disturbing the seeds after being placed in position, it is necessary to cover with thin canvas, or some such material.

V. album (white). Common Mistletoe. *fl.* green, ternate, inconspicuous. March to May. *fr.* white, nearly ¼in. in diameter, ovoid or globose, viscid. *l.* opposite or in whorls of three, 1in. to 3in. long, obovate-lanceolate, obtuse, five to seven-nerved. Branches terete, dichotomous, knotted. *h.* 1ft. to 4ft. Europe (Britain), &c. Shrub yellowish-green, glabrous. (F. D. x. 1657; Sy. En. B. 635.)

VISIANIA. A synonym of **Ligustrum** (which *see*).

VISMIA (named in honour of M. de Visme, a merchant of Lisbon). SYN. *Acrossanthes.* ORD. *Hypericineæ.* A genus embracing upwards of twenty species of stove trees or shrubs, mostly tropical American, four being found in Western tropical Africa. Flowers yellow or whitish; sepals five; petals five, often villous above; stamens in five groups; cymes terminal, sometimes few-flowered, sometimes paniculately many-flowered. Berry indehiscent. Leaves entire, often ample and tomentose or canescent beneath, gland-dotted, rarely highly glabrous. The undermentioned species, which are all that call for mention in this work, thrive in a compost of loam and peat, and may be increased by cuttings, inserted in sand, under a bell glass, in heat. All are shrubs.

V. glabra (smooth). *fl.*, calyx ovate-oblong, obtuse, glabrous; panicle loose. July. *l.* elliptic-lanceolate, glabrous, on short, compressed petioles. Branchlets compressed. *h.* 6ft. Peru, 1824.

Vismia—*continued.*

V. guianensis (Guiana). American Gamboge or Gutta-Gum Tree. *fl.* corymbose; calyx villous. August. *l.* ovate-lanceolate, acuminate, dilated at base, glabrous above, rufescent beneath; petioles short. Stems quadrangular. *h.* 8ft. Guiana, 1824.

V. guineënsis (Guinea). *fl.*, calyx ovate-lanceolate; corolla glabrous; panicle spreading. May. *l.* ovate-lanceolate, acute, softly dotted beneath; petioles slender. Stems terete; branches divaricate. *h.* 6ft. Guinea, 1823.

VISNEA (called after a Lisbon merchant named Visne, who was interested in botany). ORD. *Ternströmiaceæ.* A monotypic genus. The species is a greenhouse, evergreen tree, with the habit and inflorescence of **Eurya** (which *see* for culture).

FIG. 200. FLOWERING BRANCHLET OF VISNEA MOCANERA.

V. Mocanera (so named by Linnæus on account of the fruit being supposed by some authors to have been the Mocan, which was made into a kind of syrup, and largely employed by the aboriginal inhabitants of the Canary Islands). *fl.* rather small, sub-sessile; sepals much imbricated; petals connate at base; stamens numerous. March. *fr.* baccate, indehiscent. *l.* smooth, alternate, elliptic or lanceolate. Canary Islands and Madeira, 1815. See Fig. 200. (R. H. 1882, p. 212.)

VITELLARIA. A synonym of **Lucuma** (which *see*).

VITEX (the old Latin name used by Pliny for this or some similar shrub). SYNS. *Limia, Nephrandra, Psilogyne, Wallrothia* (of Roth). ORD. *Verbenaceæ*. A genus comprising about sixty species of stove, greenhouse, or hardy trees or shrubs, broadly dispersed over the warmer regions of the globe, a few extending to temperate Asia and South Europe. Flowers white, blue, violet, or yellowish, in variously-disposed cymes; calyx five-toothed or cleft, or rarely three-cleft; corolla tube straight or slightly incurved, usually short, the limb oblique, spreading, sub-bilabiate, five-cleft, the lower lobe largest; stamens four, didynamous; bracts small or rarely longer than the calyx. Leaves opposite, often digitately compound, rarely one-foliolate or simple; leaflets three to seven, petiolulate, entire or toothed. A selection of the best-known species is given below. *V. Agnus-castus* succeeds in any common, tolerably dry soil, and may be increased by cuttings, inserted in similar soil, under a glass, in autumn. A compost of loam and peat is most suitable for the stove and greenhouse species, which may be multiplied by cuttings, inserted in sand, under a glass, those of the stove kinds in heat.

FIG. 201. FLOWER OF VITEX AGNUS-CASTUS.

V. Agnus-castus (classical name).* Chaste-tree; Hemp-tree; Monk's Pepper-tree; Tree of Chastity. *fl.* pale lilac; cymes sub-sessile, in glomerate whorls; panicles terminal or axillary. August. *l.* long-petiolate, mostly five-foliolate; leaflets lanceolate, acuminate, attenuated at base, entire or sometimes cut-serrated, whitish beneath. *h.* 6ft. South Europe, 1670. Shrub, hardy in the South of England. See Fig. 201. (S. F. G. 609.)

V. bicolor (two-coloured). A synonym of *V. Negundo*.

V. bignonioides (Bignonia-like). *fl.* blue; cymes somewhat head-like, on peduncles 2in. to 3in. long. June. *l.* petiolate, five-foliolate; leaflets oblong, acuminate-cuspidate, narrowed at base, entire, 2in. or more long, glabrous, sub-equal; common petiole 1½in. or more long. *h.* 8ft. Venezuela, 1826. Stove tree.

V. Doniana (Don's). Black Plum. *fl.* disposed in a moderate-sized panicle. *l.* five-foliolate, obovate. Sierra Leone. A large, stove tree.

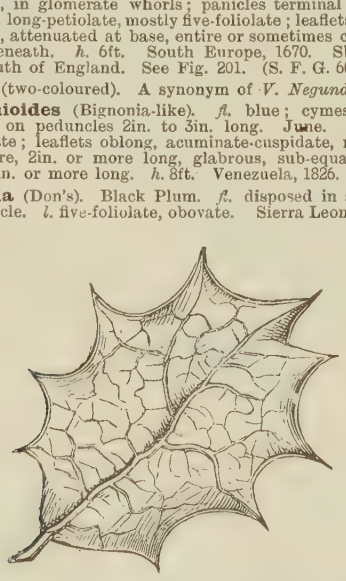

FIG. 202. LEAF OF VITEX ILICIFOLIA.

V. ilicifolia (Holly-leaved). *fl.* in axillary cymes, longer than the leaves, on long peduncles, trichotomously branched, rusty-pubescent. Summer. *l.* simple, very shortly petiolate, broadly oval, sub-acute at apex, acute or cordate-emarginate at base, very slenderly reticulate-veined; margins sinuate-toothed, the teeth spiny. West Indies. Stove shrub. See Fig. 202.

Vitex—*continued.*

V. Lindeni (Linden's).* *fl.* pale lilac, streaked with red inside the tube, shortly pedicellate or sessile, in three to six-flowered, pedunculate, axillary cymes; corolla tube thrice exceeding the calyx, the limb flat, two-lipped, the upper lip of two smaller, the lower of three larger, rounded lobes. May. *l.* digitately three to five-foliolate, on slender petioles; leaflets sessile, elliptic or elliptic-obovate, abruptly acuminate, pale green, glabrous. Branches spreading; branchlets and inflorescence hoary-pubescent. Columbia, 1876. Stove shrub or small tree. (B. M. 6730.)

V. Negundo (Negundo). *fl.* purple; corolla ¼in. to ½in. long; panicles terminal, closely white-tomentose. June. *l.* three to five-foliolate; leaflets lanceolate, entire or crenate, glabrate above, white-tomentose beneath. *h.* 4ft. India, 1812. Stove shrub or small tree, closely allied to *V. trifolia*. SYN. *V. bicolor*.

V. N. incisa (cut-leaved).* *l.*, leaflets crenate-serrate or sub-pinnatifid. India, China, &c. Greenhouse. (B. M. 364, under name of *V. Negundo*.)

V. trifolia (three-leafleted). Indian Wild Pepper. *fl.* varying from lavender to blue; corolla tomentose, ⅛in. to ¼in. long; panicles 1in. to 4in. long, oblong, white-tomentose, often leafy at base. July. *l.* simple and trifoliolate; leaflets sessile, obovate or obovate-oblong, entire, 1in. to 3in. long, sub-obtuse, glabrate above, clothed beneath with matted, scarcely stellate hairs. *h.* 4ft. India, Polynesia, &c., 1739. Stove shrub or small tree. (B. M. 2187.)

V. t. variegata (variegated). *fl.* violet-purple. *l.* opposite, with white margins. South Sea Islands, 1876. A slender, greenhouse shrub, with downy branches.

VITICASTRUM. A synonym of **Sphenodesma** (which *see*).

VITICELLA. A common name for **Clematis Viticella** (which *see*).

VITICULOSE. Sarmentaceous; furnished with vine-like twigs or suckers (viticulæ).

VITIS (the old Latin name used by Virgil, &c., perhaps from *vieo*, to bind; in allusion to its clinging character). Vine. *Ampelopsis* and *Cissus* are here included by Bentham and Hooker, but for garden purposes these are kept distinct in this work. ORD. *Ampelideæ*. A vast genus (about 230 species) of stove, greenhouse, or hardy, tendrilled, sarmentose, often tall-climbing shrubs, mostly found in tropical and sub-tropical regions, but rare in tropical America. Flowers small, umbellate, cymose, paniculate, racemose or spicate, ebracteate, sometimes polygamous; calyx four or five-toothed or lobed; petals and stamens four or five; peduncles leaf-opposed or very rarely axillary, often near the tips of the branchlets. Berries ovoid or globose, one or two-celled; cells one or two-seeded. Leaves simple or compound, very rarely bipinnate; leaflets entire, serrated or dentate, sometimes pellucid-dotted. The Grape Vine (*V. vinifera*) has been cultivated since the days of Noah, and is supposed to have been introduced into this country by the Romans. Its principal products are: Wine, vinegar, brandy, raisins, and currants. The hardy species of *Vitis* are admirably suited for covering trellis-work or walls; also for trailing over massive rockwork, or along on the ground. They usually grow strong in good, loamy soil, and, consequently, require considerable space. The foliage is very ornamental at all times, particularly when changing colour in autumn. Vines requiring indoor treatment may be planted out, or grown in large pots, and trained to rafters, or a trellis. Propagation is easily effected by cuttings, inserted in pots, and placed in a close propagating-frame. Ripened wood, of the previous year's growth, will, in most, if not all, cases, root in a similar way to the Grape Vine; and, as the plants are gross feeders, they do best in a rich, loamy soil, with some manure intermixed. *See also* **Vine.**

V. æstivalis (summer).* American Summer Grape. *fl.* with a Mignonette-like scent. May and June. *fr.* black, with a bloom, small, pleasant, ripe in October; fertile panicles long and slender, compound. *l.* simple, rounded and cordate, often variously lobed, woolly beneath, smoothish when old. *h.* 20ft. North America, 1656. Hardy climber.

Vitis—*continued.*

V. albo-nitens (shining white). *l.* oval-oblong, acuminate, cordiform at the base, shining on the upper side and suffused with a brilliant, silvery-white tone of colour. Brazil, 1871. Stove climber. SYN. *Cissus albo-nitens.*

V. amazonica (Amazon). *l.* large, oval, acuminate, smooth, glaucous, red beneath, with the veins silvery above; young ones almost linear, their veins very strongly marked. Amazon, 1866. A pretty, stove climber. SYN. *Cissus amazonica.*

V. antarctica (Antarctic). Kangaroo Vine. *fl.* tomentose-pubescent; cymes dense, broadly corymbose, shorter than the petioles. July. *fr.* globular. *l.* simple, petiolate, ovate or oblong, mostly acuminate and slightly cordate, 3in. to 4in. by 1½in. to 2in., entire, sinuate or irregularly toothed, rather firm or almost coriaceous. Australia, 1790. Tall, greenhouse climber. SYN. *Cissus antarctica* (B. M. 2488).

V. Bainesii (Baines'). *fl.* on glandular pedicels, cymose; peduncles terminal, as long as the stem. July. *l.* ternate, rather shortly petiolate (the lower ones sometimes simple); leaflets ovate or oblong, unequally serrated, penniveined; stipules twin. Trunk turnip-like, 1½ft. in circumference. *h.* 4½ft. Western tropical Africa, 1864. A dwarf, glaucous, succulent, stove tree. (B. M. 5472.)

FIG. 203. BRANCHLET OF VITIS DAVIDIANA.

V. capriolata (tendrilled). *fl.* on pedicels ¼in. to ½in. long; cymes axillary or terminating in short, lateral branches, pedunculate; peduncles conspicuously bracteate. *fr.* black, globose, two to four-seeded, the size of a currant. *l.* five-foliolate; petioles 1½in. to 2½in. long; leaflets 1½in. to 3in. by ½in. to 1½in., lanceolate or narrowly ovate or sub-ovate, acute or sub-acuminate, bristly-serrate in the notches. Temperate Himalayas. Hardy, with the protection of a wall, in the South of England.

V. chontalensis (Chontales). *fl.* scarlet, disposed in compound cymes. December. *l.* trifoliolate, of a lovely green; lateral leaflets obliquely ovate, acuminate, terminal one elliptic, all toothed. Branchlets angular. Chontales Mountains, Nicaragua, 1869. An elegant, glabrous, stove climber. SYN. *Cissus chontalensis.*

V. cirrhosa (tendrilled). *fl.* minute, in dense cymes. *l.* digitately three to seven-foliolate; leaflets succulent, sub-sessile, obovate, remotely dentate-serrate, quite glabrous in cultivation. Stems long, weak, brittle, fleshy, furnished with long, bifid tendrils. South Africa, 1866. A straggling, glabrescent or pilose, greenhouse shrub.

Vitis—*continued.*

V. cordifolia (cordate-leaved). Chicken, Frost, or Winter Grape. *fl.* very sweet-scented. May and June. *fr.* blue or black, with a bloom, small, very acerb, ripening after frosts; panicles compound, long and loose. *l.* thin, not shining, cordate, acuminate, sharply and coarsely toothed, obscurely three-lobed, smooth or nearly so, and bright green on both sides. *h.* 12ft. North America, 1806. Hardy climber. *V. riparia* (B. M. 2429) is a mere form of this, with broader, cut-lobed leaves.

V. Davidiana (David's). *fl.* small. *fr.* violet, not edible. *l.* palmately lobed, the margins of the broad lobes toothed; petioles red, long. China. A vigorous-growing, hardy climber, speedily covering a large surface. See Fig. 203. SYNS. *Cissus Davidiana* (R. H. 1868, p. 29, f. 2), *C. platanifolia, C. rubricaulis.*

V. Endresii (Endres'). *l.* cordate, deep velvety-green, the veins being of a deep purplish-brown. Costa Rica, 1875. A strong-growing, stove climber.

V. gongylodes (rounded). A synonym of *V. pterophora.*

V. heterophylla humulifolia (variable-leaved Hop-leaved). Turquoise-berried Vine. *fl.* minute, sub-umbellate; cymes on slender peduncles, sparingly divided. *fr.* of a fine, pale, china-blue colour, dotted with black, globular. *l.* on slender, red petioles, three to five-lobed, with a broad sinus at base; lobes acutely serrated, dark green and rugose above, pale beneath, with pubescent veins. Stems 2ft. to 5ft. long. North China and Japan, 1868. Hardy climber. (B. M. 5682.)

V. hypoglauca (glaucous beneath). *fl.* yellow, minute, but pretty, freely produced in axillary cymes. *l.* digitately five-foliolate, oval or oblong, light green above, beautifully glaucous beneath when young. Tendrils wanting. Australia. Greenhouse or conservatory shrub.

V. japonica (Japanese). *fl.* green, disposed in panicles. *l.* compound; leaflets five, petiolate, the four lower ones bijugate, glabrous, roundish-oval, denticulate, the odd or terminal one larger, oval-elliptic, acuminate. Japan, 1875. A half-hardy climber, of vigorous, quick-growing habit. SYN. *Cissus japonica.* A variety called *marmorata*, with broad, yellow blotches on the leaves, has sported from this.

V. javalensis (Javali Mine). *fl.* bright scarlet, in compound cymes. *l.* much handsomer than those of *V. chontalensis*, simple, cordate, acuminate, mucronate-toothed, above green and beautifully velvety-pubescent, the midrib and veins purplish, below glabrous and purplish. Chontales Mountains, Nicaragua, 1869. A highly ornamental plant. SYN. *Cissus javalensis.*

FIG. 204. FRUITING BRANCHLET OF VITIS LABRUSCA.

V. Labrusca (classical name).* American Plum Grape; Isabella Grape; Northern Fox Grape. *fl.* Mignonette-scented. June.

Vitis—*continued.*

fr. dark purple or amber-coloured, large, with a tough, musky pulp, ripe in September or October; fertile panicles compact. *l.* simple, rounded and cordate, variably lobed, rusty-woolly

FIG. 205. FRUITS OF VITIS LABRUSCA.

beneath. Branchlets (and young leaves) very woolly. *h.* 12ft. North America, 1656. Hardy climber. See Figs. 204 and 205. (R. G. 765, 1.) SYN. *V. Thunbergii* (R. G. 424).

V. lanata (woolly).* *fl.* green, small, forming a thyrsoid, paniculate cyme. May. *fr.* purple, four-seeded, round, the size of a large pea. *l.* cordate-ovate, shortly acuminate, usually 3in. to 6in. by 1¾in. to 3in., sometimes larger, usually softly pubescent, but occasionally felted beneath or nearly glabrous. Himalayas, 1824. Hardy. The leaves of this species assume a beautiful scarlet colour in autumn.

V. Lindeni (Linden's). *l.* bright green, freely mottled with white between the veins. Branches terete, tendrilled. United States of Colombia, 1871. A smooth, shrubby, greenhouse climber. SYN. *Cissus Lindeni* (I. H. ser. iii. 2).

V. macropus (gouty-stemmed). *fl.* four-parted, disposed in a rather broad corymb. April and May. *fr.* reddish-violet, the size of a pea. *l.* (at first plicate and white-tomentose), long-petiolate, the lowest one on the branch tri-, the rest five-foliolate; leaflets ovate-elliptic or obovate, shortly stalked, toothed, cobwebby-pubescent. Trunk forming a large bulb, bi-tribrachiate, covered with smooth, green bark. *h.* 1ft. to 2½ft. South Benguela, 1864. A dwarf, stove tree, more curious than beautiful. (B. M. 5479.)

V. planicaulis (flat-stemmed). *fl.* four-parted; cymes subcorymbose, with divaricating branches. May and June. *fr.* red (?), the size of a cherry. *l.* on petioles 4in. to 7in. long; leaflets 5in. to 8in. long, on stalks ¾in. to 1½in. long, oblong-lanceolate, slightly acuminate, obtusely serrated. India, &c. A vast, stove, glabrous climber. (B. M. 5685.)

V. pterophora (wing-bearing).* *fl.*, cymes pedunculate, with thick, divaricate branchlets. Autumn. *l.* long-petiolate, trifoliolate; leaflets ample, sessile, rugose-undulated, trapezoid- or rhomboid-obovate, acuminate, serrated, with impressed, reticulated nerves, the terminal one somewhat three-lobed, the lateral ones oblique or dimidiate-ovate, with the lower margin produced in a lobe; stipules fuscous-purple, ample. Each branch bears at its extremity (after ceasing to grow for the season) an elongated, fleshy tuber, 5in. to 6in. long, which finally drops off, and, on reaching the ground, under favourable circumstances, forms a new plant. Brazil. A unique, tall-climbing, villous, stove plant (B. M. 6803.) SYN. *V. gongylodes* (G. C. n. s., xix., p. 53).

V. quadrangularis (four-angled). *fl.* green, in small, shortly-stalked, glabrous cymes. Summer. *fr.*, berry globose, red, the size of a pea, very acrid. *l.*, when present, small, broadly-cordate or reniform. Stems glabrous, four-winged, very thick and fleshy, greatly contracted at the nodes, generally leafless. India, Java, &c. A curious and interesting, quick-growing, warm house climber.

V. riparia (river-bank). A form of *V. cordifolia.*

V. striata (striped). *fl.* greenish, inconspicuous, in cymes opposite the leaves. *fr.* reddish, the size of small peas. *l.* rather thick, dark green, digitate; leaflets sessile, oblanceolate, serrated, cuneate at base. Stems and tendrils glabrous. South Brazil and Uruguay, 1881. A beautiful, hardy, evergreen climber.

V. Thunbergii (Thunberg's). A synonym of *V. Labrusca.*

V. vinifera (wine-bearing). Common Grape Vine. *fl.* in loose or crowded, ovate or cylindrical racemes. June and July.

Vitis—*continued.*

fr. purple varying to white and green, watery or fleshy, sweet musky, or sour. *l.* lobed, sinuately toothed, naked or downy. South of the Caspian. Hardy climber. (B. M. Pl. 66; S. F. G. 242.) *See also* **Vine.**

V. v. amurensis (Amur). *l.* entire or three to five-lobed; young leaves woolly on both sides. (R. G. 339.)

V. vulpina (Fox Grape). Bullace; Muscadine. *fl.* densely disposed in small panicles. May. *fr.* purplish, without bloom, musky, ½in. to ¾in. in diameter, with a thick and tough skin, ripening early in autumn. *l.* shining on both sides, small, rounded, cordate at base, coarsely broad and blunt-toothed, seldom lobed. Branchlets minutely warty. North America. Hardy climber.

VITTARIA (from *vitta*, a riband; alluding to the narrow fronds). Including *Tæniopsis.* ORD. *Filices.* A genus comprising about thirteen species of tropical, stove Ferns. Fronds grass-like, sub-coriaceous, with free veins. Sori in continuous marginal or slightly intra-marginal lines. The species known in gardens are here described. For general culture, *see* **Ferns.**

V. elongata (lengthened). *fronds* 6in. to 18in. long, ⅛in. to ¼in. broad, the point acute or rather blunt, the lower part very gradually narrowed to the base; midrib faint or distinct; veins simple, immersed. *sori* quite sunk in a marginal groove, with two nearly equal lips opening outwards. Himalayas, Australia, &c. SYNS. *V. ensiformis, V. zosteræfolia.*

V. ensiformis (sword-shaped). A synonym of *V. elongata.*

V. lineata (lined). Florida Ribbon Fern. *fronds* 6in. to 18in. long, ⅛in. to ⅜in. broad, gradually narrowed downwards to a stout, compressed stem which passes gradually into the frond, the edges often reflexed; midrib distinct, raised; veins immersed, parallel. *sori* in a broad, slightly intra-marginal line in a slight furrow, the edge of the frond at first wrapped over it. West Indies, Guinea Coast, &c., 1793. SYN. *Tæniopsis lineata.*

V. scolopendrina (Scolopendrium-like). *fronds* 1ft. to 1½ft. long, ¼in. to ¾in. broad, the point acute, the edge entire, the lower part very gradually narrowed to the base; midrib blackish, thick, grooved in front below; veins oblique, fine, parallel. *sori* in broad, continuous, sub-marginal lines, the firm, unaltered edge of the frond at first wrapped over it. New Guinea, Ceylon, &c. SYN. *Tæniopsis scolopendrina.*

V. zosteræfolia (Zostera-fronded). A synonym of *V. elongata.*

VITTATE. Longitudinally striped.

VITTMANNIA. A synonym of **Willemetia** (which *see*).

VIVIANIA (named in honour of Domenico Viviani, 1772-1840, a professor and botanist of Genoa, &c.) SYN. *Macræa.* ORD. *Geraniaceæ.* A genus embracing about eight species of stove or greenhouse herbs, sub-shrubs, or small shrubs, inhabiting extra-tropical or sub-tropical South America. Flowers regular, sub-fasciculate or corymbose-paniculate in the upper axils; calyx of five, rarely four, valvate lobes; petals five, rarely four, hypogynous, twisted; stamens ten, rarely eight, free, all bearing anthers. Leaves opposite, entire or often crenately or deeply toothed, usually snowy-tomentose beneath. It is doubtful whether the under-mentioned species are now in cultivation. They are, however, pretty, greenhouse shrubs, and thrive in a compost of loam, peat, and sand. Propagation may be effected by young cuttings, inserted in sand, under a glass.

V. grandifolia (large-leaved). *fl.* white or red; peduncles shorter than the leaves. July. *l.* grey and glandular beneath, with prominent veins. Branches pubescent. *h.* 1ft. to 2ft. Chili, 1832.

V. parvifolia (small-leaved). *fl.* rose-coloured; peduncles shorter than the leaves. July. *l.* snowy beneath, obscurely veined. Branches cobwebby. *h.* 1ft. to 2ft. Chili, 1832.

VIVIANIEÆ. A tribe of *Geraniaceæ.*

VOANDZEIA (*Voandzou* is said to be the name of the plant in Madagascar). SYN. *Cryptolobus.* ORD. *Leguminosæ.* A monotypic genus. The species is a shortly-creeping, stove herb. Its flower-stalks, like those of *Arachis hypogæa*, bend down after flowering, and increase in length, so that the young pods are pushed into the earth, beneath which they ripen. For culture *see* **Arachis.**

Voandzeia—*continued.*

V. subterranea (underground). Bombarra Ground Nut; Underground Bean. *fl.* pale yellow, partly unisexual, partly perfect; two upper calyx teeth or lobes connate; standard orbicular; peduncles short, axillary, few-flowered. July. *fr.*, pods irregularly sub-globose, two-valved. *l.* long-petiolate, pinnately trifoliolate, stipellate. *h.* 3in. Tropics, 1823.

VOCHISIA. *See* **Vochysia.**

VOCHYA. A synonym of **Vochysia** (which *see*).

VOCHYSIA (*Vochy* is the Guiana name of *V. guianensis*). Sometimes spelt *Vochisia.* SYNS. *Cucullaria, Strukeria, Vochya.* ORD. *Vochysiaceæ.* A genus embracing about forty species of stove shrubs or often tall trees, inhabiting Brazil, Guiana, Eastern Peru, and New Grenada. Flowers yellow, odorous, rather large, in compound, elongated racemes or panicles; sepals five, connate at base, the posterior one large and often spurred; petals one to three, linear or spathulate, two of them smaller than the other; fertile stamen one; staminodia two; pedicels bibracteolate. Leaves decussately opposite or whorled, often coriaceous, sometimes prettily veined, as in *Calophyllum;* stipules small, subulate. Only a couple of the species have been introduced. Both are trees, thriving in a mixture of loam and peat. They may be increased by ripened cuttings, inserted in sand, under a glass, in heat.

V. guianensis (Guiana). Copai-yé-wood. *fl.*, spur spreading; racemes simple, erect, terminal, dense-flowered. August. *l.* opposite, obovate-oblong, shortly acuminate, glabrous on both sides. *h.* 12ft. and upwards. Guiana, 1822. (A. G. i. 6.)

V. tomentosa (tomentose). *fl.*, racemes terminal, loose, slightly nodding. August. *l.* opposite, oval-oblong, long-acuminate, attenuated at base, glabrous above, ferruginous-tomentose beneath. *h.* 25ft. Guiana, 1826.

VOCHYSIACEÆ. A small natural order of trees, often gigantic, with copious, resinous juice, rarely erect, sarmentose, or climbing shrubs, confined to tropical America. Flowers irregular, hermaphrodite, often large; sepals five, free or connate at base, or rarely adnate to the ovary, the two outer ones often smaller, the two anterior larger, the posterior often largest, spurred or gibbous at base; petals hypogynous, or inserted on the top of the calyx tube, one, three, or rarely five, when one is protruded between the blade of the anterior sepals, clawed; stamens inserted with the petals, usually fertile, the rest imperfect; filaments usually thick, excrescent, subulate; pedicels jointed and bracteate; inflorescence variable. Fruit usually capsular, rarely a winged samara. Leaves opposite, whorled, or alternate, shortly petiolate, coriaceous, quite entire; stipules small, reduced to glands, or wanting. Branches usually opposite or whorled. The order embraces seven genera, and about 100 species. Examples: *Qualea, Trigonia, Vochysia.*

VOHIRIA. A synonym of **Voyria** (which *see*).

VOLKAMERIA. A synonym of **Clerodendron** (which *see*).

VOLKMANNIA. A synonym of **Clerodendron** (which *see*).

VOLUBLE. Twining round some support.

VOUAPA (the Guiana name). ORD. *Leguminosæ.* A small genus (about three species) of stove, evergreen trees, natives of Guiana, now included, by Bentham and Hooker, under *Macrolobium.* Flowers racemose; calyx four-cleft, with two opposite, stipitate bracteoles at the base; petal one, flat; stamens three. Leaves unijugate. Only one species has been introduced. It thrives in a compost of sandy loam and a little peat. Propagation may be effected by ripened cuttings, inserted in sand, under a glass, in heat.

V. bifolia (two-leaved). *fl.* violet; calyx lobes spreading; stamens nearly equalling the corolla; bracts elevated-uninerved. May. *l.*, leaflets sessile, ovate, acuminate, oblique. *h.* 10ft. 1823. The proper name of this plant is now *Macrolobium bifolium.*

VOUAY. A synonym of **Geonoma** (which *see*).

VOYRIA. (*Voyra* is the Guiana name of one of the species). SYNS. *Humboldtia* (of Necker), *Leiphaimos, Lita, Vohiria.* ORD. *Gentianeæ.* A genus comprising about sixteen species of dwarf, leafless, stove herbs, found growing on putrid wood and leaves in tropical America and (one species) Africa. Flowers white, yellow, orange, or rarely blue or pink, solitary or few in a cymose cluster; calyx tubular or campanulate, four or five-toothed or lobed; corolla salver-shaped, with an elongated tube and four or five twisted, spreading lobes; stamens four or five, included; filaments filiform or very short. Scales minute, opposite or the lower ones rarely alternate. The species are probably not now in cultivation.

VRIESIA. Included under **Tillandsia** (which *see*).

VULPIA. Included under *Festuca.*

WAAHOO. *See* **Euonymus atropurpureus.**

WACHENDORFIA (named after E. J. Wachendorf, 1702-1758, a Dutch botanist, professor at Utrecht). SYN. *Pedilonia.* ORD. *Hæmodoraceæ.* A small genus (seven

FIG. 206. WACHENDORFIA THYRSIFLORA

Wachendorfia—*continued.*

species have been enumerated, but probably not more than three are truly distinct as such) of greenhouse or half-hardy, tuberous-rooted, perennial herbs, confined to South Africa. Flowers in terminal panicles, often villous; perianth yellow, oblique, the tube wanting; segments narrow or obovate-oblong, the outer ones, especially the back one, dissimilar to the rest, decurrent to the pedicels; stamens three. Leaves few, ensiform or rarely linear, sometimes large, more or less plicate-veined. Stem erect, sometimes thickened at base. A mixture of very sandy loam and a little peat is well suited to the requirements of Wachendorfias. If planted out in a pit or frame, where protection from frost can be ensured, they will flower much stronger than if kept in pots. Little or no water should be given during the resting season. Propagation may be effected by offsets, or by seeds. Some of the species will thrive in the open air in the South of England if planted in a sheltered position.

W. brevifolia (short-leaved). *fl.* nodding; perianth crimson, intermixed with tawny-yellow, softly hairy outside; raceme loose. April. *l.* lanceolate, five-nerved, plicate, villous, distichous, about 6in. long, falcately diverging. Stem 1ft. high, green, hairy. 1795. (B. M. 1166.)

W. hirsuta (hairy). *fl.* drooping; perianth red in bud, golden-yellow when expanded; peduncles four or five-flowered, secund; panicle spreading; bracts villous. April. *l.* linear-ensiform, three-nerved, villous. Stem 1½ft. high, villous. 1687. (B. M. 614.) SYN. *W. villosa* (A. B. R. 398).

W. paniculata (paniculate). *fl.*, perianth golden-yellow, the segments pubescent outside, rubicund, obovate; pedicels racemose, secund, pubescent; peduncles spreading, three to five-flowered. April. *l.* ensiform, three-nerved, bifarious, one-third the length of those of *W. thyrsiflora*. Stem greenish, corymbose-paniculate. *h.* 1½ft. 1700. (B. M. 616.) *pallida* is a form with a pale yellow perianth. (B. M. 2610.)

W. thyrsiflora (thyrse-flowered).* *fl.* in a terminal spike, the rachis angular; perianth yellow, the lobes cuneate-lanceolate; lower branchlets of the spike three or four-flowered. May. *l.* ensiform, five-nerved, glabrous. Stem nearly simple. *h.* 2ft. 1759. See Fig. 206. (B. M. 1060.)

W. villosa (villous). A synonym of *W. hirsuta.*

WAFER ASH. A common name for **Ptelea trifoliata** (which *see*).

WAHLBOMIA. A synonym of **Tetracera** (which *see*).

WAHLENBERGIA (named after George Wahlenberg, of Upsala, 1780-1851, author of "Flora Lapponica," &c.). SYN. *Schultesia* (of Roth). Including *Cervicina* and *Edrianthus*. ORD. *Campanulaceæ*. A large genus (nearly eighty species) of greenhouse or hardy, annual, perennial, or woody-stemmed herbs, mostly natives of the Southern hemisphere, especially South Africa; a few inhabit the tropics of America and the Old World, and the Mediterranean region; and one species is broadly distributed over Western Europe. Flowers often blue and nodding; calyx tube adnate, hemispherical, turbinate, or obconical-oblong, the limb five, rarely three or four-parted; corolla campanulate, tubular, sub-rotate, or funnel-shaped, the limb shortly or rarely deeply five-cleft, very rarely three or four-cleft; stamens free of the corolla; inflorescence often irregularly centrifugal; peduncles terminal, lateral, or axillary, solitary or variously paniculate. Capsules erect, inferior or half-superior. Leaves alternate or rarely opposite. The best-known species are here described. For culture, *see* **Campanula.**

W. albo-marginata (white-margined). A synonym of *W. saxicola.*

W. capensis (Cape). *fl.* at first drooping, but at length nearly erect; corolla bluish-green outside, dark blue inside at the bottom, greenish at the origin of the violaceous lobes, spotted with black within the lobes at the recesses; peduncles elongated, one-flowered. July. *l.* ovate-lanceolate or lanceolate, pilose, irregularly toothed, 1in. to 2in. long. Stem 1ft. to 1½ft. high. Cape of Good Hope, 1819. Half-hardy annual. SYNS. *Campanula capensis* (B. M. 782), *Roella decurrens* (A. B. R. 238).

W. capillacea (capillary). *fl.* in a terminal, leafless panicle, on pedicels; corolla blue, ½in. long, funnel-shaped. May. *l.* numerous, alternate, fascicled, linear-filiform, entire, ¼in. to

Wahlenbergia—*continued.*

½in. long. Stems erect, 1ft. to 1½ft. high. South Africa, 1822. Greenhouse perennial.

W. dalmatica (Dalmatian). A synonym of *W. tenuifolia.*

W. gracilis (slender). Australian Harebell. *fl.* very variable in size and form; calyx three to five-lobed; corolla blue, purplish, or white, ⅛in. to ¼in. long, three to five-lobed. April. *l.* ½in. to 2in. long; radical ones spathulate, petiolate, toothed; cauline ones sessile, linear-oblong, entire, toothed, or sinuate, acute or acuminate, rarely spathulate. Stem 6in. to 24in. high. New Zealand, &c., 1794. A slender, greenhouse annual. SYNS. *Campanula capillaris* (L. B. C. 1406), *C. gracilis* (B. M. 691; S. E. B. 45).

W. hederacea (Ivy-like).* *fl.* one to a peduncle, leaf-opposed; corolla pale blue, ½in. long, the lobes recurved. July and August. *l.* all petiolate, orbicular or cordate, angled or obscurely lobed, ¼in. to ½in. in diameter, the upper ones often opposite. Stems filiform, creeping. Europe (Britain). Annual. SYN. *Campanula hederacea* (Sy. En. B. 875).

W. Kitaibelii (Kitaibel's).* *fl.* disposed in terminal, bracteate groups; corolla blue, with a tinge of purple; bracts acuminate, dentately sub-serrated. Summer. *l.*, radical ones crowded, linear-subulate, remotely denticulate. Stems purplish, beset with soft pili. *h.* 6in. Transylvania. A tufted, hardy perennial. (B. M. 6188.)

W. saxicola (rock-loving).* New Zealand Bluebell. *fl.* pale lilac, erect; corolla campanulate, thrice exceeding the calyx; scape solitary, long, one-flowered. June. *l.* all radical, usually rosulate, spathulate, long-attenuated to a flat, ciliated petiole, above usually hairy, entire or crenate-serrated, white and thickened on the margins. *h.* 2in. to 8in. New Zealand. Greenhouse perennial. (B. M. 6613.) SYNS. *W. albo-marginata W. vincæflora* (L. & P. F. G. ii., fig. 142).

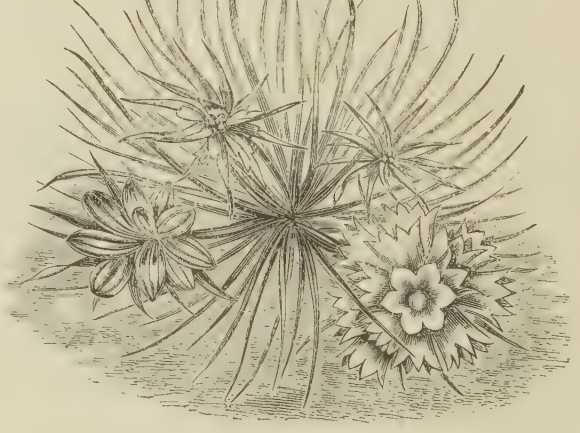

FIG. 207. WAHLENBERGIA TENUIFOLIA.

W. tenuifolia (slender-leaved).* *fl.* six to ten in a dense, terminal, bracteate tuft; calyx lobes bristly-ciliate; corolla violet-blue, white at the base. June and July. *l.* linear, entire, with bristly margins. Stems pilose, purplish, tufted. *h.* 3in. to 6in. Dalmatia, 1879. Hardy perennial. See Fig. 207. (B. M. 6482.) SYNS. *W. dalmatica, Edrianthus tenuifolius.*

W. tuberosa (tuberous-rooted).* *fl.* white, marked on the outside with bright rose-red bands, numerous at the tips of the paniculate branches, ½in. long, campanulate, erect. Summer. *l.* linear, acute, spreading, 1in. long, one-nerved. Stems slender, erect, 6in. to 2ft. high, loosely branched. Juan Fernandez, 1875. A remarkably floriferous, tuberous-rooted, greenhouse perennial. (B. M. 6155; R. G. 1877, p. 213.)

W. vincæflora (Periwinkle-flowered). A synonym of *W. saxicola.*

WAHLENBERGIA (of Blume). A synonym of **Webera** (which *see*).

WAHOO. *See* **Ulmus alata.**

WAILESIA (named in honour of G. Wailes, a great collector of Orchids). SYNS. *Dipodium* (now the correct name), *Leopardanthus*. ORD. *Orchideæ*. A small genus (about six species) of stove, terrestrial Orchids, natives

Wailesia—*continued.*

of the Malayan Peninsula and Archipelago, the Pacific Islands, and Australia. Flowers frequently dotted, rather large, in simple racemes; sepals and petals sub-equal, free, spreading; lip erect, adnate to the column, slightly gibbous or very shortly saccate at base, three-lobed to the middle, the lateral lobes narrow or triangular, the middle one longer; column erect, semi-terete; pollen masses two. Leaves, when present, narrow, coriaceous. Stems leafy at base, or the floriferous ones leafless. Only two species have been introduced. For culture, *see* **Bletia.**

W. picta (painted). *fl.*, sepals and petals pale ochre within, externally yellow, with reddish-brown spots, oblong, acute; lip extended in a sac, trifid, white at base, the rest pale purple, obscurely striated; peduncle above 9in. long, with a few distant sheaths, racemose at apex; bracts very short. *l.* oblong-lanceolate, acuminate. Adventitious roots ascending. Java, 1849. SYNS. *W. rosea* (P. M. B. xvi., p. 321), *Dipodium pictum* (R. X. O. 107, ii.-iv.).

W. punctata (dotted). *fl.* more or less red, usually spotted with purple; sepals and petals six to eight lines long; lip as long or rather longer, the basal pouch or gibbosity very short, the middle lobe obovate-oblong, twice as long as the erect lateral ones; raceme sometimes very short, occupying one-third of the stem. Stem erect, 1ft. to 2ft. high, leafless, with a few sheathing, loosely imbricated scales. Australia 1822. SYNS. *Dendrobium punctatum* (S. E. B. i. 12), *Dipodium punctatum* (B. R. 1280).

W. rosea (rose-coloured). A synonym of *W. picta.*

FIG. 208. UPPER PORTION OF PLANT OF WAITZIA AUREA.

WAITZIA (named in honour of F. A. C. Waitz, who travelled in Java, and wrote on the plants of that island). SYN. *Viraya.* Including *Morna.* ORD. *Compositæ.* A genus comprising half-a-dozen species of pretty, greenhouse, annual, Australian herbs. Flower-heads ("everlasting") in terminal corymbs, or rarely in oblong, leafy

Waitzia—*continued.*

racemes; involucral bracts all coloured and petal-like, imbricated in many rows; receptacle without scales; florets numerous, all hermaphrodite, tubular, five-toothed; achenes terminating in a slender beak. Leaves alternate, linear. The best-known species are here described. For culture, *see* **Celosia.**

W. acuminata (taper-pointed). A synonym of *W. corymbosa.*

W. aurea (golden).* *fl.-heads* rather larger, fewer, and in a looser corymb, than in *W. corymbosa*; involucre golden-yellow or tinged with brown, the bracts distinctly exceeding the florets. Summer. *l.* resembling those of *W. corymbosa.* *h.* 1ft. to 2ft. 1835. See Fig. 208. SYN. *Morna nitida* (B. R. 1941).

W. corymbosa (corymbose). *fl.-heads* usually numerous, in a dense, terminal corymb; involucre pale or dark yellow, white, or light pink, the outer bracts passing into small scales. Summer. *l.* linear, the lower ones often 2in. to 3in. long, stem-clasping at base, the margins revolute. *h.* 1ft. to 2ft. 1864. Plant scabrous-pubescent or hoary. (B. M. 5443.) SYN. *W. acuminata* (R. G. 401).

W. grandiflora (large-flowered). *fl.-heads* bright yellow, much larger than those of *W. aurea.* Summer. *l.* much resembling those of *W. aurea*, but less hairy. *h.* 1ft. to 2ft. 1863.

W. nivea (snowy).* *fl.-heads* rather large, usually few in a loose corymb; involucral bracts pure white or pink, or very rarely pale yellowish, not exceeding the florets. Summer. *l.* linear, scabrous-pubescent or almost glabrous. *h.* 1½ft. 1836. SYN. *Morna nivea* (B. R. 1838, 9).

W. Steetziana (Steetz'). *fl.-heads* solitary or in loose corymbs, smaller than in *W. nivea*; involucre varying from a pure white to a pale or bright yellow, hemispherical, about ½in. in diameter. Summer. *l.* linear. *h.* less than 1ft. 1861. SYN. *W. tenella* (B. M. 5342).

W. tenella (tender). A synonym of *W. Steetziana.*

WAITZIA (of Reichenbach). A synonym of **Tritonia** (which *see*).

WAKE ROBIN. A common name for *Arum maculatum* and *Trillium grandiflorum.*

WALDSCHMIDIA. A synonym of **Limnanthemum** (which *see*).

WALDSTEINIA (named in honour of Count Francis von Waldstein, 1759-1823, a German botanist and author). Including *Comaropsis* (in part). ORD. *Rosaceæ.* A small genus (four species) of hardy, creeping, perennial herbs, with the habit of *Fragaria*, natives of Central and Eastern Europe, Northern Asia, and Eastern temperate America. Flowers yellow, rather large; calyx persistent, with or without five minute bracteoles; petals five, obovate; stamens numerous; pedicels often curved; scapes bracteate, two to five-flowered. Leaves alternate, long-petiolate, entire, lobed, three to five-cleft, or three to five-foliolate with crenate or incised leaflets; stipules rather large, membranous. Only three species call for description here, the North American *W. lobata* probably not being in cultivation. They are rather pretty plants, thriving in ordinary soil. Propagation may be effected by divisions, or by seeds.

W. fragarioides (Strawberry-like).* Barren Strawberry. *fl.*, petals longer than the calyx. June. *l.* trifoliolate; leaflets broadly wedge-shaped, cut-toothed. North America, 1803. SYNS. *Comaropsis fragarioides, Dalibarda fragarioides* (B. M. 1567; L. B. C. 408).

W. geoides (Geum-like). *fl.* smaller than those of *Potentilla verna.* June. *l.* palmately three to five-lobed; lobes acutely toothed. Hungary, &c., 1804. (B. M. 2595.)

W. trifolia (three-leaved). *fl.*, petals rounded at the base, without auricles; ovary silky-villous. April and May. *l.* smaller than those of *W. geoides*; leaflets very shortly stalked, beset with long hairs. *h.* 4in. to 6in. Eastern Europe.

WALKING LEAF. A common name for **Scolopendrium rhizophyllum** (which *see*).

WALKS. Few things contribute more to the appearance of a garden than good, properly-proportioned Walks. Those that are to last in good condition must be properly made at first, as it is not an easy matter to keep repairing them, and, besides, it is seldom satisfactory. Various kinds of material are used, as much depends on what can be most readily procured. To make Walks in a proper

Walks—*continued.*

manner, and provide all the material, is rather an expensive proceeding, particularly on a large scale. Where gravel of a binding nature is procurable, it is generally preferred to other materials for the surface, as being most appropriate, and best suited for garden paths. One of the principal objects is to make Walks so that they can be used in all weathers without discomfort; but this is often somewhat difficult, for although the gravel may be of a nature which is in good condition in wet weather, it will often be rough and stony during continued drought. The amount of traffic which a Walk is likely to have over it will prove of assistance as a guide in its formation. Besides gravel, asphalte, concrete, burnt ballast, and other substances, are sometimes used for the surface. Something may generally be said in favour of Walks formed of the two first-named—*e.g.*, absence of weeds, durability when once made properly, and cleanliness at all times. Where it is necessary to have a hard, dry Walk, it may be preferable to make the surface of asphalte or concrete; but, as a rule, this is neither practicable nor desirable for garden paths where gravel is procurable in sufficient quantity. The question as to what the surface of a Walk shall be composed of, need not be further discussed, but left for settlement by individuals who have often to be guided by what materials they can procure.

Passing on to the formation of Walks, such materials as are best adapted will be referred to. One of the most important considerations is efficient drainage; this may be readily insured where the ground is undulated, but not so easily on a flat surface. Sometimes, Walks will drain themselves naturally without pipes, if the subsoil is composed of gravel; but wherever they are sufficiently wide to be of importance, and there is clay beneath, a proper system of drainage is necessary. A good plan is to lay a row of ordinary 3in. drain-pipes the full length, either beneath the centre or near one side of the Walk, and conduct the water to the best available outlet. Catch-pits, with iron gratings on the top, should be placed on both sides near the edges, and these should be connected with the drain, so that any quantity of water may run away as fast as it enters. The width to be determined upon will vary, sometimes according to the length of the Walk, and at others to the extent of the space or inclosure through which it passes. In a large, walled-in kitchen-garden, for instance, it is usually found most convenient to have a Walk running parallel with the wall all round, allowing a space of 10ft. or 12ft. between for a border, on which vegetables, &c., may be cultivated, and two others intersecting each other in the centre of the inclosure, where it is very convenient to have a water basin for a constant supply. The intersecting Walks in this arrangement may be a little wider—2ft. or 3ft.—than those running parallel with the walls; this will distinguish them as being the principal ones. In very large gardens, it may be necessary to have more divisions than these, and, in addition, small, narrow paths, for subdividing the ground, are requisite; these latter are not usually gravelled. Flower-gardens, pleasure-grounds, terraces, &c., have Walks which vary greatly in width, as a matter of course; but the system of making may be carried out similarly in all.

The nearer the two edges are to a level or an equal incline, the easier is it to proceed. When laying out a new garden or grounds, some fixed points have to be made from which the levels are taken, and their positions must correspond somewhat to the natural disposition of the ground. Assuming that the width is determined, and a new Walk is to be made, the edges, of whatever description they are, must be first levelled and prepared. The level, or an equal fall from two fixed points, may be ascertained by the use of borning-rods; a straight-edge, 10ft. to 12ft. long, and a good spirit-level, are also requisite.

Walks—*continued.*

Edges require to be finished before the Walk is made, as they are a guide for gravelling, which it should not be necessary to alter afterwards. The mode of levelling with borning-rods for the edges and the Walk is similar; the highest and lowest points at the ends of any given length are fixed by pegs driven into the ground, and from these the proper height can be readily found throughout the intervening space. To insure firm edges, they should be made up with soil that is in a workable condition, and rendered firm by thorough ramming. New Walks, that are to be 10ft. or more wide, require excavating to a depth of from 9in. to 12in., the lowest point being made in the centre or wherever the drain-pipes are intended to be laid. When these are inserted, about 6in. of rough material, such as clinkers or old bricks, should be placed above them; then a layer of something in the way of rough ballast, which should be well rammed, and the surface left in the shape which it should present when finished; and then 2in. or 3in. of fine gravel should be laid over the top. This will become much less in bulk so soon as it is trodden over and the roller applied.

The proper height of the Walk, when finished, may best be indicated by driving in wooden pegs down its centre, about 10ft. apart: the positions of these may be obtained by the levelling instruments in the same way as for the edges, and the pegs can be pulled up as the finishing coat of gravel is put on. All Walks should be kept higher in the centre than at the edges, in order that rain-water may pass readily into the gratings, and efficient surface drainage be insured. The height at which it is advisable to fix the centre of a Walk above the edges depends on the width. Walks less than 8ft. wide, and with a fall lengthways, will generally be sure to drain if the centre is kept on the same level as the verge or edging, provided the surface is made so that the gravel at the edges is about 2in. lower when the work is completed. The iron gratings may be placed 2in. below the level of the edges in almost all walks. The centres of 8ft. or 10ft. walks should be raised 1in. above the edge level, and, as a general rule, ½in. more may be added for every 2ft. width, so that a walk 28ft. or 30ft. wide would require its centre up 4in. to 6in. above the edges, to prevent water accumulating there instead of passing to the gratings. These heights will not be found too great a proportion for the widths; this always needs consideration, or the surface will not be comfortable to walk upon.

Before proceeding to put on the finishing coat of gravel, the rough material beneath must be rammed quite firm, and consolidated about equally throughout. The top gravel should be levelled with a wooden rake, used by a workman who, from experience, is able to do it properly. The want of a spit may cause a hollow place in the surface, and improper levelling has an equally objectionable effect, which will be readily apparent when rain comes. As the person levelling proceeds, another should be treading the surface crossways, and removing the levelling pegs, which, by this time, have served their purpose. A second rake must then follow, to remove any stones and inequalities caused by treading. A light roller may then be used, and afterwards a heavy one, if the Walk will carry it without the gravel clinging. It is advisable to get new gravel firmly rolled, if possible, before rain comes, as if water gets into it when loose, it often takes a long time to get a solid surface. To keep gravel Walks in good order, they must be rolled frequently when the weather allows, both in summer and winter. If the surface is too dry, but little good would result from rolling, and if too wet it might cling, or be positively injured; some judgment must, therefore, be exercised in selecting the proper times when rolling may be beneficially practised.

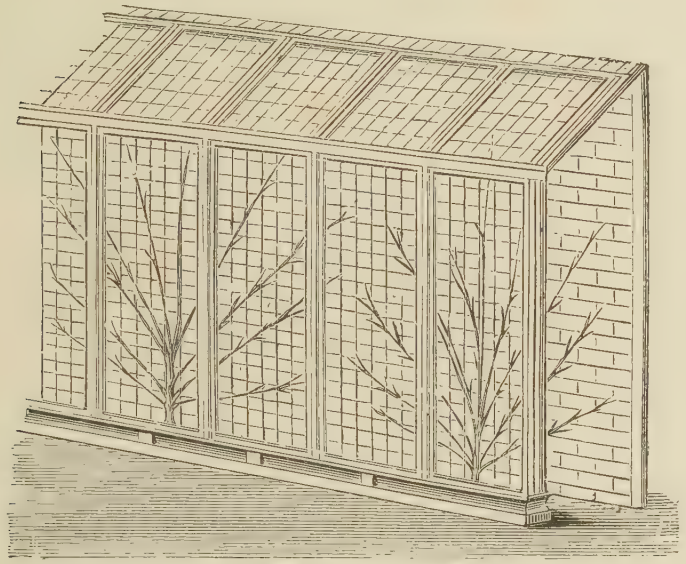

FIG. 209. WALL CASE.

WALL CASE OR FRAME. A general term applied to a glass protection sometimes put over such fruit-trees as Apricots, Peaches, and Nectarines, in unfavourable localities, where the fruits cannot be depended upon to ripen outside. A Wall Case or Frame (see Fig. 209) is, practically, an unheated, narrow house; but if glass protection without heat is unsafe against the injury caused by spring frosts, it would be preferable to incur the further expense of having a house which, for erecting, would, in many cases, not cost very much more, when the wall was already at command, and insert sufficient hot-water pipes to keep out frost. The interior would then be available, so far as space permitted, for accommodating many other plants in winter which merely require a slight protection.

WALL CRESS. *See* **Arabis.**

WALL FERN. *See* **Polypodium vulgare.**

WALLFLOWER. *See* **Cheiranthus Cheiri.**

WALLFLOWER, ALPINE. A common name for **Erysimum ochroleucum** (which *see*).

WALLICHIA (named after Dr. Nathaniel Wallich, 1786-1854, a Danish botanist, and author of several valuable works on Indian plants). SYNS. *Harina*, *Wrightia* (of Roxburgh). ORD. *Palmæ*. A small genus (two or three species) of East Indian, dwarf, tufted, stove Palms. Flowers yellowish, mediocre, monœcious or rarely polygamous, bracteate and bibracteolate; spathes very numerous, slenderly coriaceous, the lower ones narrower, tubular, the upper ones boat-shaped, complete, imbricated; spadices shortly pedunculate, the males drooping or decurved, ovoid, much-branched, dense-flowered, the females looser, erect. Fruit reddish or purple, ovoid-oblong, one or rarely two-celled and seeded. Leaves densely fascicled, in one species terminal and distichous, furfuraceous, unequally pinnatisect; segments solitary or the lower ones fascicled, cuneate at base, oblong, obovate, or oblanceolate, erose-toothed, the terminal one cuneate; petioles slender, laterally compressed; sheaths short, cut at the margins and furnished with long

Wallichia—*continued.*

hairs. The species require to be grown in a strong, rich soil. Propagation may be effected by seeds, when procurable; or by gradually separating the suckers, so as to allow them to make sufficient root before they are quite detached.

W. caryotoides (Caryota-like).* *fl.*, males yellowish-white, covering the spadix branches; females few, amongst the males near the bases of the branches. July. *fr.* ovate-oblong, the size of a nutmeg. *l.* few, alternate, petiolate, 3ft. to 8ft. long; leaflets sessile, 1ft. to 1½ft. long, the lower ones in opposite fascicles, the upper ones mostly solitary and alternate, all wedge-shaped, præmorse at apex, deep shining green above, whitish beneath. India, 1825. See Fig. 210.

W. densiflora (dense-flowered). *fl.*, male spadices enveloped in large, imbricated spathes, of a dark purple, streaked with yellow; these separate, and then a dense cluster of nearly white female spadices, with violet-coloured ovaries, appears. *l.*, lower pinnæ binately fascicled, whitish below, the rest solitary, sinuate-lobed or toothed. Plant stemless. *h.* 12ft. Assam, 1840. (B. M. 4584.)

WALLISIA (of Regel). Included under **Tillandsia** (which *see*).

WALLISIA PRINCEPS (of Regel). A synonym of **Lisianthus princeps** (which *see*).

WALL PENNYWORT. A common name for **Cotyledon Umbilicus** (which *see*).

FIG. 210. WALLICHIA CARYOTOIDES.

WALL PEPPER. *See* **Sedum acre.**

WALL PLANTS. These are very numerous, if the whole of the subjects requiring or benefiting by wall accommodation is considered. Kitchen-garden walls are requisite for the cultivation of fruit-trees that will not succeed in the open; and these are rarely given up to other plants, excepting such as Tomatoes, which, in favourable aspects, succeed during summer in any intervening spaces. The term Wall Plants is usually meant to have reference to those subjects which, from their natural habit of growth, require a wall; but it may also include very many others that, from their quick-growing nature, may be utilised for rapidly covering a large surface, or, from being more or less tender, are cultivated with greater certainty, and brought to greater perfection, by the shelter which a wall affords. Walls in greenhouses, stoves, and most other glass structures, may also be utilised for the production of some crop, or covered with some plant to impart a much better appearance than would otherwise be the case. Of hardy plants that succeed admirably on walls, the following, amongst many others, may be mentioned: *Aristolochia Sipho*, *Chimonanthus fragrans*, many species and hybrids of *Clematis*, Cotoneasters, *Cratægus Pyracantha*, Escallonias, *Euonymus*, *Forsythia suspensa*, *Garrya elliptica*, Ivies, *Jasminum officinale* and *J. revolutum*, Loniceras, Magnolias, *Pyrus japonica*, Roses, *Tecoma radicans*, hardy Vines, Virginian Creepers, *Wistaria sinensis*, &c. Camellias are sometimes grown very successfully as Wall Plants in greenhouses; and apart from their flowers, the foliage is always attractive. Strong-growing kinds of Tea Roses do well on walls in any cool house, or on the back wall in a peach-house. Fuchsias, Heliotropes, Jasminums, Passifloras, &c., are well-known wall-furnishing plants. *Ficus stipulata* will cover a wall in a cool house or stove with green verdure as dense as Ivy does outside; it is, therefore, a very desirable subject.

WALLROTHIA (of Roth). A synonym of **Vitex** (which *see*).

WALLROTHIA (of Sprengel). Included under **Seseli** (which *see*.)

WALL RUE. *See* **Asplenium Ruta-muraria.**

WALLS. These are requisite for the proper cultivation of fruit-trees and numerous other subjects which require shelter and a warm situation; and the less favourable aspects which must of necessity be presented by one, or sometimes even both of the surfaces, may also be utilised for some purpose. In a kitchen garden the Walls serve as a boundary for the inclosure; and as, during sunshine, they accumulate a considerable amount of heat, which is given off when the air becomes cooled, most of the trees on southern aspects, at any rate, are in a warmer temperature even at night than they would be in the open ground. Amongst the principal fruits which in nearly every locality require Wall protection are Apricots, Figs, Nectarines, and Peaches. Morello and dessert Cherries, dessert Pears, and Plums, are also best, as a rule, on Walls; the Morello succeeds well in a north aspect, which is a great advantage.

The actual work of construction does not usually come within a gardener's province, but he has, not unfrequently, to propose the dimensions or give instructions how the work is to be executed. In a large garden, the Walls should be 10ft. to 12ft. high—the top of anything less than this would soon be reached by any of the fruit-trees named above. For a small garden, these heights might be too much for the inclosed area to be proportionate, and 8ft. would then be sufficient, but high Walls are always far superior to low ones. The materials commonly used are bricks (the dimensions of which are fairly uniform in all localities) and mortar. It is most important

Walls—*continued.*

that garden Walls be substantially built, and the foundations made to rest on a solid bottom; the weight will, in course of time, cause settlements, if any portion of the ground is of a different character, and the base is, consequently, not of an equally solid description throughout. The foundations should be, at the base, quite double the width of the wall that they are intended to support. The proper thickness depends considerably on the height. Walls that are only to be carried 6ft. or 8ft. high may be constructed, if the material and workmanship are good, in 9in. work—that is, the length of one brick. Higher Walls than these should not be less than 14in. thick, while 18in. is much more substantial, and better in all ways. These dimensions are readily obtained by using bricks: 14in. allows the length of one and the width of another, and 18in. the length of two, for the total thickness. Walls are sometimes constructed with less solidity than this, and supported by occasional buttresses on one or both of the sides; these are objectionable unless really needed, because of their interference with the proper training of trees, and it may be pointed out that they swallow up a considerable quantity of bricks that would help to build a thicker and more substantial Wall, and one which would be more satisfactory in the long run. All kitchen-garden Walls should be provided with a coping projecting over from 2½in. to 3in. on each side, and grooved beneath the under side of the projection for drip. Stone, if not too expensive, is the best material for copings; the entire part at the top should be slightly higher than the sides, so that water may pass off readily. For the protection of tender fruit-blossoms in spring, when this is necessary, it is better to put up a temporary board coping from 6in. to 9in. wide, on brackets fixed to the Wall, than to make the permanent one too wide. This can easily be removed when no longer required; and if the edge of the board is placed beneath the stone, and the brackets are of triangular shape, there will be no danger of drip on the blossoms. Walls should always be kept in good repair: the holes caused by nailing in the mortar, and larger ones often caused by the action of frost, are invariably harbours for insects. Where insects are very numerous, as is often the case in old Walls, a dressing of fresh lime and sulphur, thickened with a little clay, and made a dark colour by the addition of sufficient soot, may be annually used, if desired. It should be applied during the time the trees are bare, when a little falling on them will seldom do any harm. *See also* **Garden.**

WALLWORT. An old name for **Sambucus Ebulus** (which *see*).

WALNUT (*Juglans regia*). The common Walnut is a well-known tree, fine in foliage as an ornamental subject for planting in parks, paddocks, &c., and useful for its fruits, both in the young and ripened state, and for the timber, which is largely employed by cabinet-makers and others, and for the purpose of making gun-stocks. Propagation is effected by seeds; also by budding, grafting, and inarching for perpetuating varieties. Seeds of Walnuts designed for timber-trees, are best sown where the trees are intended to develop, if this is practicable; or they may be stratified through winter, and planted in nursery rows, about 2ft. apart, in February or March following. The young trees may either be transplanted in the autumn, or allowed to remain a year longer; they each form a long tap-root, which proceeds straight down, and if transplanting is intended, it must not be too long deferred in the first place. Ring-budding and shield-budding, with a pushing eye, and also whip and cleft grafting, are successful methods of propagation, and all are performed while the sap is in active circulation. Walnut-trees succeed in any fairly good soil; if of good depth and resting on a gravelly bottom, it is

Walnut—*continued.*

to be preferred. The delicate young shoots and fruits are liable to be much injured by late spring frosts.

Walnuts for pickling should be gathered when the shell is quite soft, so that a needle will readily pass through.

FIG. 211. FRUITING BRANCH OF WALNUT (*Juglans regia*).

The ripe fruits (see Fig. 211) drop, and their husks open and disclose the nut in a way which is generally familiar. Squirrels will collect large quantities and store them; if there are any of these animals about, the crop must be secured as soon as ripe, or the depredators destroyed. Walnuts may be preserved in several ways for use during winter: dried and packed in clean jars or casks, with alternate layers of sand, they keep well; or placed in jars with close-fitting lids, and buried in the ground. Placing them in jars and sprinkling them with salt, and burying in oak sawdust, are other methods of preservation which have been recommended.

DISEASES, &C. The Walnut is not affected by any disease of sufficient importance to call for special remark; though several insects and Fungi attack the tree and fruit, they do no appreciable harm in England.

SORTS. Small-fruited varieties are best for growing to produce fruit. Besides the common Walnut, which is an abundant bearer, the following are most desirable:

DWARF PROLIFIC, a dwarf-growing variety which bears abundantly when quite small. HIGHFLYER, early, of medium size, thin-shelled. THIN-SHELLED, an excellent variety, with a thin, tender shell, well filled; of better quality than the common variety.

WALNUT-TREE, INDIAN. A common name for **Aleurites triloba** (which *see*).

WALSURA (altered from *Wallursi*, the Telinga name). ORD. *Meliaceæ*. A genus comprising about a dozen species of stove, evergreen trees, limited to India and the Indian Archipelago. Flowers small; calyx short, five-cleft or five-parted; petals five, ovate-oblong, spreading; filaments ten or eight; panicles axillary and terminal. Leaves one to five-foliolate; leaflets opposite, quite entire, pale beneath. Perhaps *W. robusta* is not now in cultivation. *W. piscidia* is met with in botanic gardens. They require similar treatment to that recommended for **Chloroxylon.**

W. piscidia (fish-poison). *fl.* sordid-yellow; petals imbricated; staminal tube half the length of the petals, equally ten-cleft. June. *l.* 2in. to 7in. long; leaflets 1in. to 4in. long, ⅜in. to 1⅝in. broad, sub-ternate, elliptic, obtuse, often retuse, glabrous, shining, pale beneath *h.* 20ft. India, 1830. The bark acts as a fish-poison.

Walsura—*continued.*

W. robusta (robust). *fl.* white, ¼in. long; panicles nearly as long as the leaves, densely puberulent. June. *l.* 6in. to 12in. long; leaflets five, sometimes three, ovate or elliptic, acuminate, shining. *h.* 20ft. and upwards. India, 1827.

WALTHERIA (named in honour of Aug. Fried. Walther, 1688-1746, Professor at Leipzig). ORD. *Sterculiaceæ*. A genus embracing about sixteen species of stove, stellate-pubescent herbs, sub-shrubs, or rarely trees; one is broadly dispersed over temperate regions, two are found in Africa, two in Oceania, and the rest are American. Flowers often rather small, glomerate or cymose in the axils, or disposed in terminal heads, racemes, or panicles; calyx five-cleft; petals five. Leaves serrated. The species possess little beauty, and are probably now unknown to cultivation.

WAMPEE-TREE. *See* **Cookia.**

WANDERING JEW. *See* **Saxifraga sarmentosa.**

WANGHEE OR WHANGEE CANE. *See* **Phyllostachys nigra.**

WARATAH-TREE. *See* **Telopea speciosissima.**

WARDEN. An old name for a variety of Pear used in making "Warden pies."

WARDIAN CASE. Wardian Cases are invaluable for packing pot-plants that have to travel long sea voyages. By their aid many new and rare plants of foreign climates are annually imported into this country, and others which we possess are exported in a similar way. The importation and exportation of plants in Wardian Cases is mostly conducted by some of the principal nurserymen and those in charge of botanic gardens, who usually make special arrangements, so that what they send away or have sent to them shall be of sufficient value and importance to warrant the outlay incurred, which is often somewhat considerable. Certain seasons are also selected for sending plants to particular countries abroad, such as are best calculated to favour a safe voyage in respect of the effect of climatic conditions on the plants during transit. Wardian Cases are made in different sizes to hold small or somewhat large plants, as the case may be. The pots are usually packed in soil or cocoa fibre, and held in position by narrow strips of wood, which are firmly secured by nailing them close down on the top of each inside the Case. The roof, if it may be so called, is made of two frames which fit on the ends and meet together at the top, where they form a ridge. They are glazed, and the glass protected by thin pieces of wood, which are fixed a short distance apart, so as to allow as much light as possible to pass to the plants inside. One or both of these sash-frames is movable, and may be unscrewed and taken off for the purpose of packing or unpacking. When travelling, Wardian Cases are nearly air-tight, so that but little evaporation or change of air can take place, only a small circular hole, covered with perforated zinc, being allowed at each of the ends near the top. The frames in which the glass is embedded are made air-tight by being fitted up with putty before being screwed. Instructions are invariably given as to the part of a ship where Wardian Cases should be placed during the voyage.

Other kinds of Wardian Cases are those used for plant-culture in drawing-rooms, &c., and in ferneries, for the special accommodation of Filmy Ferns, and such as require a very moist atmosphere. The former, with

Wardian Case—*continued.*

the stands on which they are placed, are usually rendered ornamental for associating with the surroundings, and have a fine appearance when filled with green Ferns, small foliage plants, and Lycopods. In Ferneries, such cases may be quite plain externally; they, of course, answer their purpose equally well for preserving moisture inside.

WARENCE. An old name for Madder (*Rubia tinctorum*).

WARMOT. An old name for Wormwood (*Artemisia*).

WARREA (named by Lindley in honour of its discoverer, Frederick Warre, who sent plants to the Loddiges, by whom it was figured under the name of *Maxillaria Warreana*). ORD. *Orchideæ*. A small genus (according to Bentham and Hooker, one or two species) of stove, terrestrial Orchids, natives of Brazil, Peru, Columbia, &c. Flowers showy, shortly pedicellate; sepals and petals broad, concave, the lateral ones oblique at base, adnate to the foot of the rather long, clavate column; lip affixed to the foot of the column, sessile, very shortly contracted towards the base and incumbent, at length erect, broad, and concave, the lateral lobes scarcely prominent, the middle one expanded, entire or bifid, the disk having elevated, fleshy lines; pollen masses four; racemes elongated, loose; scapes leafless, many-sheathed, tall, simple; bracts short. Leaves few, distichous, elongated. Stem leafy. *W. tricolor* and its variety require similar treatment to that recommended for **Phaius.** Several species formerly included here will now be found under **Zygopetalum.**

W. tricolor (three-coloured).* *fl.* rather large, globose, drooping; sepals and petals yellowish-white, the two lateral sepals below ending in a blunt spur; lip yellow and deep purple, white at the edge, obovate, cucullate at base, the disk having three ridges; scapes lateral, purple at the joints, about 2ft. high, bearing an eight to ten-flowered raceme. June and July. *l.* long-petiolate, lanceolate, plicate. Pseudo-bulbs oblong, terete attenuated, jointed. Brazil, 1843. (R. X. O. 24.) SYN. *Maxillaria Warreana* (B. M. 4235; L. B. C. 1884).

W. t. stapelioides (Stapelia-like). *fl.*, sepals and petals barred with brown internally; lip with a broad, purplish-brown stripe in front. New Grenada, 1872.

WARSZEWICZELLA. Included under **Zygopetalum** (which *see*).

WARTED GOURD. *See* **Cucurbita Pepo verrucosa.**

WARTS. Hard or firm excrescences.

WASHINGTONIA (so called after George Washington, the great American patriot). ORD. *Palmæ*. A small genus (one or two species) of tall, greenhouse Palms, natives of South California and Arizona. Flowers white, hermaphrodite; spathes elongated, membranous, cut, glabrous; spadices elongated, copiously paniculate-branched, the branches slender and flexuous. Fruit black, small, ellipsoid, one-celled, one-seeded. Leaves terminal, ample, spreading, orbicular, flabellately plaited, cut nearly to the middle; the segments induplicate, with filiferous margins; petioles elongated, robust, flat-convex, the margins very spiny. For culture, *see* **Chamærops.**

W. filifera (thread-bearing).* *fl.* perfect, solitary, nearly sessile upon the slender branches of the panicle. *l.* circular, flabelliform; petioles armed with stout, hooked, marginal spines; ligule large and adpressed, coriaceous, glabrous; rachis short; blade deeply cleft along the upper folds and copiously filiferous. Flowering stems 8ft. to 10ft. long. A tree 20ft. to 40ft. high. California. SYNS. *Brahea filamentosa*, *Pritchardia filamentosa*, *P. filifera.*

W. robusta (stout). *l.* sub-orbicular; petioles armed with strong spines, sheathing at the base; limb fan-shaped, plaited, entire to the middle, then divided into narrow, acute rays, bordered with white filaments. *h.* 6ft. to 7ft. California. (R. H. 1885, p. 403.)

WASHINGTONIA (of Winslow). A synonym of **Sequoia** (which *see*).

WASHINGTON THORN. *See* **Cratægus cordata.**

WASPS. These insects are too well known to every one to require any description of their form, colour, markings, or power of stinging. There are, however, several species of Wasps in Britain. Though they agree in so many respects that no one can fail to recognise them as Wasps; and though they are so like one another in form, in colours, and in markings that it is not very easy for any one but an entomologist to distinguish them, yet they differ in the places in which they make their nests, and in the means to be employed against them when they become troublesome in gardens.

The True Wasps, belonging to the genus *Vespa*, are all social insects, like their kindred, the Honey Bees; but, unlike the latter, there is little difference between the

FIG. 212. COMMON WASP (*Vespa vulgaris*).

sexes in outward appearance. The common Wasp (see Fig. 212) is a good representative of the whole group, the sexes differing in little but size; and the other species being distinguished chiefly by the forms and sizes of the black markings that are scattered on the yellow ground-colour, and by the presence in some of rusty-brown spots on the sides of the body. The Wasps belong to a division of the **Hymenoptera** (which *see*), which have the fore wings folded lengthwise, like a fan, when at rest, and the hind wings hidden below them. This division, besides the true Wasps, includes a large number of insects, known as Solitary Wasps, that resemble them in general form, and to some extent also in colour: but anyone familiar with the appearance of the common Wasp will find no real difficulty in distinguishing the one from the other; while to state the characteristic distinctions would require more space than is here available, without affording any corresponding advantage. The Solitary Wasps are so named because they do not live in societies like the true Wasps; and each female among them forms the cells or chambers to be occupied by the larvæ hatched from the eggs laid in them, and she stores the cells with the proper food. This frequently consists of larvæ of small Moths, or of other insects; and the Wasps that capture these should be protected by gardeners as far as possible, as they assist in the destruction of noxious insects. The Solitary Wasps make the cells for the protection of their larvæ in the most varied situations. Some females dig burrows in sandy soil, and at the end of each burrow form a cell, which is stocked with provisions, among which an egg is placed. Others tunnel in the pith of dead Rose-twigs, &c., while some take advantage of the burrows of other insects, or of any crevice, or even of empty snail-shells, in which to form the cells; and still others build mud cells, often of peculiar forms, against stones or on plants. It would be impossible to give a full account here of the exceedingly diverse habits observed among the Solitary Wasps. In regard to them it need only be added that none are injurious to gardens, while several are useful, as stated above.

To return to the Social or True Wasps, belonging to the genus *Vespa*. They are of doubtful reputation with gardeners, but are decidedly more hurtful than beneficial in gardens. It is true that they are voracious creatures, and feed largely on other insects, and that they destroy considerable numbers of noxious or troublesome species; but the benefits conferred by them in this way are more than counterbalanced by the injury they do to ripe fruits. They are very partial to apricots and plums; but, where these are not to be obtained, they attack gooseberries,

Wasps—*continued.*

leaving little but empty skins. They are extremely numerous in some seasons, while in others scarcely a Wasp can be seen. A brief account of their life-history will suggest suitable methods for lessening their numbers.

The Common Wasp (*Vespa vulgaris*) may be selected as representative of the genus in its life-history. Towards the close of autumn by far the greater number of the Wasps die; and only a few females survive the winter. The Wasps one sees in spring, exploring holes and crevices in the ground, in old walls, in heaps of rubbish, or in tree trunks, are females in search of secure retreats in which to form nests; and each one killed at this season prevents the formation of a nest during the summer. Those that find suitable localities enlarge them, if necessary, to the size required for the commencement of the nests. A very favourite locality is a mouse-hole. Each female works by herself for a time in forming her nest, the coverings and cells in which are made of a kind of paper. This substance, it is believed, is prepared from the fibres of wood rasped by the Wasps from the surface of naked trunks or of posts, rails, or other articles, moistened with a fluid from the mouths of the insects, and made into a paste. The Wasp fixes a short pillar of this to some firm body—*e.g.*, the root of a plant, or a stone, in the roof of the hole—and then forms two or three cells, mouth downwards, on the free end of the pillar, and builds an umbrella-like roof above them. In each cell an egg is laid; and, after a short time, the larvæ are hatched, and require to be tended and fed by the parent Wasp. The food given to the larvæ while young is chiefly honey, taken from Bees, or from ripe fruits; but, when the larvæ are older, they are fed on flies and other insects. When Wasps can gain access to grocers' and butchers' shops, they are apt to become troublesome in their efforts to obtain sugar and animal food from the supplies in the shops, instead of from the usual sources. As the larvæ grow, the cells have to be enlarged around them; and at last they become full-fed, spin over the

FIG. 213. PUPA OF WASP.

opening of the cell, and pass into the state of pupæ (see Fig. 213). The female Wasp continues to form new cells, and to feed the young brood; and, as soon as the perfect insects have emerged from the pupæ, they assist her in her work. The Wasps that develop in early summer are incapable of laying eggs, and are called neuters; they are, in reality, females in which the reproductive organs remain undeveloped. As the number of cells is increased, the size of the hole must be enlarged, and the outer coverings of the nest removed and relaid, of a size to permit of the nest in its new dimensions being contained within them. As the number of Wasps is augmented from the young broods, the nest increases more and more rapidly in size, and combs are added, each new one being suspended from its predecessor by numerous supports of the papery material, strengthened by an extra allowance of the gluey secretion from the insects' mouths. Space is left between the combs to permit the Wasps to move about freely, and to gain easy access to every cell. Towards the end of summer, both males and females are developed, in addition to the workers or neuters, to secure the perpetuation of the species. When the winter is near, the Wasps have been observed to tear open the cells containing larvæ, which they then destroy. The instinct to do so is a merciful one, as the larvæ would otherwise perish of starvation, from the pain of which they are saved by this speedy mode of death. Besides *V. vulgaris*, certain other species of the genus make their nests in holes; but others suspend their nests from the branches of trees or bushes (see Fig. 214). Except in situation, the latter nests agree

Wasps—*continued.*

with those formed in holes, the outer covering being made sufficiently strong to prevent injury from the weather; these nests are entered by a small hole below, or on one side near the bottom.

The Hornet (*V. Crabro*) differs from its congeners in its larger size. It is not scarce in the South of England, where it nests in hollow trees or in outhouses. The material employed by Hornets in making the paper for their nest is usually *rotten* wood. These insects sting much more severely than Wasps; but they feed almost wholly on other insects, including Wasps, and must be regarded as friends in the garden.

Remedies. In districts where Wasps are very numerous, it is often necessary to destroy them and their nests, in order to protect the fruit, and to prevent annoyance from their entering houses, and using their stings. Prevention is best secured by encouraging the capture of the females in spring, as this prevents them from commencing the nests. The numbers may also be lessened either by capturing the insects, or by destroying the nests. Wasps may be caught in summer and autumn in various simple traps

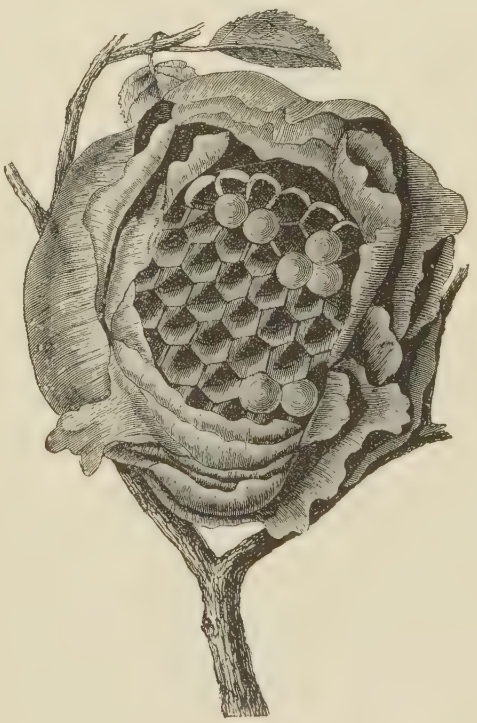

FIG. 214. NEST OF TREE WASP.

—*e.g.*, a bottle containing a little sweet fluid of any sort suspended in a tree. A good trap is easily prepared by placing a bell glass on three supports, so as to leave space for insects to fly or crawl in below to the bait (sugar, treacle, or other sweet stuff), placed in a plate under the bell glass. The latter should open at the top by a hole, and above it should be placed another glass, closed at the top. The insects, on rising from the bait, fly upwards, pass through the hole in the lower glass, and are trapped in the space between it and the upper one. The glass "fly-catchers," now coming into use, effect the capture of Wasps in a similar way, and deserve a trial by any one troubled with an abundance of the insects. The situations of the nests determine the most likely methods

Wasps—*continued.*

to insure their destruction. The Wasps do not work at night, hence that time should be chosen for operations against them. Nests in holes may be destroyed by means of squibs of mealed gunpowder and sulphur. One of these should be pushed through a piece of turf about a foot square, and two or three inches thick; the squib should be lighted, and put into the Wasps' burrow, and the turf closely pressed down to keep in the smoke. Wet mud plastered round the turf helps in this object; and some of the mud should be placed over the hole when the squib is driven out by the final explosion. A more difficult method is to flood the nest with hot water. Tree Wasps' nests can best be destroyed by placing a pail of water underneath at night, and cutting the support of the nest, so as to allow the nest and its occupants to fall into the water. The pail should have a lid, in case any of the Wasps should climb out of the water. Such nests may also be smoked with sulphur, but with less certain results.

In the article on the **Honey Bee** (*Apis mellifica*), the promise was made that the habits of that insect should be treated of in connection with those of Wasps, with which the former insect agrees in many particulars. Some of the leading features of agreement and of difference between them are, therefore, here briefly indicated.

Like the social Wasps, the honey bees live in large societies, including workers (or neuters), females (or queens), and males (or drones), and form their nests in holes when in the wild state. Bees in domestication live in hives; but not infrequently a swarm, on leaving the parent hive, will select a hole for themselves, from which it is often very difficult to dislodge them. But though Bees agree with Wasps in these respects, they differ from them in many important particulars, and to these points of difference attention must now be given.

Bees form new nests in a different way from Wasps. The females, or queen bees, do not themselves work at the nests; nor do they rear the young grubs or feed them, as is done by the female Wasps in spring. The only duty of the queen bees is to lay eggs, which are at once taken care of by the workers; and the latter alone nurse the grubs, and look after the pupæ. The queens leave the nests to pair; and after they have paired they return very soon, and never again leave the hives, except in swarming, when one queen goes with each new colony. At all other times they remain inside, surrounded by a multitude of workers, which feed their queen, and follow her as she deposits her eggs in the cells prepared for them. Each new nest of honey bees is thus not the work of a single female, but is formed by a colony or swarm from some older nest, the bees in which have become too numerous to remain at home with advantage to the commonwealth. Each swarm consists of a queen and a number of workers.

Among Wasps there is, comparatively, little difference between workers, females, or males; but among honey

Worker. Queen. Drone.

FIG. 215. HONEY BEES.

bees the differences are evident. Fig. 215 shows that they differ in size and form of body; and also that the eyes of the male are so large as to meet on the top

Wasps—*continued.*

of the head; while in the females and neuters the eyes are entirely lateral. The males, or drones, take no part in the work of the hive. They are produced from eggs laid usually in April or May, and assume their perfect condition in summer. They fly during the warmest part of the day, and pair with the newly-emerged queens during flight. If the impregnation of a queen is retarded till twenty-eight days after hatching, she lays only male eggs. In hives where the queen is laying eggs from which workers can be reared (*i.e.*, if impregnation has not been long delayed after she reached maturity), it has been observed that the workers, towards the beginning of autumn, attack the drones, and kill them by stinging them. Where the queen is capable of laying only male eggs, and also when the queen has died, or has been removed from the hive, the males are not killed till a fertile queen has been secured. There is only one queen bee in each hive; but if she is lost, the workers proceed to rear others from worker-larvæ, by enlarging their cells and supplying them with abundance of food. This treatment causes the earlier stages to be passed through in a shorter time, and also produces a marked result in modifying the bodily structure—the bees produced being true females, with all the physical peculiarities that distinguish the latter from the workers. When it is necessary to replace a queen, there are usually from twelve to twenty larvæ reared for the purpose. As soon as the first queen that reaches maturity is able, she goes round the cells containing the others, still in the state of pupæ, and gnaws a hole in each cell. If the cell contains a queen ready to emerge, the latter is stung by her older rival. The workers pull the pupæ or dead bodies of the queens from the cells, and remove them. Should two queens emerge at the same time, it has been observed that one kills the other. So, also, when a stranger queen is introduced into a nest, she and the rightful queen fight till one is killed.

At the periods of swarming, the workers prevent the slaughter of as many young queens as are required for the nest and the swarms. The old queen leads off the first swarm; and the young females that are to go with new swarms are not permitted to emerge from their cells till the swarms are ready to depart. Thus fatal contests are prevented among them.

The workers differ from the queens as follows: They are smaller; the jaws, or mandibles, are more prominent; the maxillæ and tongue are longer, and the upper lip and antennæ are black (in the queens the upper lip is fulvous, and the antennæ are pitchy-brown); the legs are black, with the tarsi brownish; the basal joints of the tarsi, and the tibiæ of the hinder legs, are broader, and hollowed externally, and bear stiff hairs on the sides and across them, so placed as to form a receptacle in which to carry the pollen, or "bee-bread," collected from flowers for the nourishment of the bees and of the larvæ; the abdomen is broader and less pointed, and the three middle segments bear a small wax-pocket on each side near the base. These differences are very considerable; yet the facts that the larvæ of workers can be made by special treatment to produce queens, and that the workers possess (functionless) representatives of ovaries, show that they are indeed females in which the reproductive organs have remained undeveloped, and which are fitted to perform special duties for the good of the community. The workers do all the work of the hive: they build the cells, collect the honey, pollen, and a resinous substance known as "propolis," and feed and attend to the young. These operations are so varied that they are divided between two classes of workers, of which one prepares the wax, and the other attends more especially to building it into cells, collecting the food, and rearing the young.

The makers of wax eat some sugar or honey; and a number of them cling together, in a cluster of festoons,

Wasps—*continued.*

for about twenty-four hours, without active movement. During this time, the wax is formed in thin plates, one in each of the little pockets mentioned above as occurring on the three middle segments of the abdomen. When the wax is formed, the bee detaches the plates from the pockets, and chews them up, mixed with a liquid from the mouth, into a riband, which is deposited on the place where it is to be made into cells. After the wax-makers have deposited the materials, the other class of workers build it up into the cell walls, making the cells larger or smaller, as required for the females, males, and workers. The edges of the cells are finished with a kind of adhesive varnish, which melts less easily than wax, and is redder in colour. This is the "propolis," which the bees collect from the bud-scales of Horse Chestnuts, Poplars, and other trees possessed of sticky buds. Attention has frequently been called by zoologists and mathematicians to the regularity of form and of size in the cells, and also to the fact that their form secures the greatest possible inclosed space with the smallest possible expenditure of wax.

Many of the cells are occupied by larvæ or pupæ; but others are employed as storehouses for the honey, and often the cells from which young bees have emerged are cleared out and filled with honey. The visits made by bees to flowers, in the course of which they are of so great use in effecting pollination in many plants, have as their object the collection of nectar and of pollen. (*see* **Nectar, Nectary, Orchid Fertilisation,** and **Pollination**). The bees swallow the nectar, and continue their visits to flowers till the stomach, or honey-bag, is filled with the sweet fluid. They then collect the pollen, forming little masses of the grains brushed off their bodies; they place them upon the hairy, flattened portions of the hind legs, and they thus form a load of food to be carried back to the hive. In the stomach the nectar undergoes a change by which it is converted into honey, and this is either given at once by the collectors to those bees that have been at work in the hive, as food, or is poured into the cells. Those which contain honey that is soon to be used are not closed; but such as are reserved for food during winter are covered with wax. The pollen is either eaten by the bees themselves, or is given to those that have been at work in the nest, or to the larvæ, or it is stored away in cells for future use. On these stores the bees subsist during winter; hence the nests are not broken up on the approach of cold weather: nor do the bees resemble Wasps in destroying their larvæ in autumn, as they can provide them with food. When the honey is taken from hive bees, it is necessary to supply them with sugar and water, or with other sugary substances, from which they can prepare honey.

It may be mentioned, in conclusion, that there are several kinds of bees in domestication, of which *A. mellifica* is the commonest, and has been specially kept in view above; the other species differ only from it in minor details.

WATER. Water is so indispensable to the very existence of plants, that its use and modes of action deserve to be more fully understood than they are by many gardeners. It is made up of a combination of two gases, Oxygen and Hydrogen, in the proportion of sixteen (by weight) of the former to two of the latter. By volume, the proportion is one of Oxygen to two of Hydrogen, the chemical formula being H_2O. The properties of Water are, for the most part, so well known as to render it needless to dwell upon them. When pure, it has neither colour, taste, nor smell; nor does it leave any solid matter when it is allowed to evaporate by heat or by exposure to the atmosphere. That Water is converted into ice, and rain into snow, at a low temperature (32deg. Fahr.), is a fact familiar to everyone in such a climate as ours. While it is freezing, the

Water—*continued.*

Water frees itself from by far the greater part of mineral substances that may be dissolved in it; so that ice consists of almost pure Water, even when formed from the salt Water of the sea. Pure Water has the power of dissolving many mineral substances and gases in greater or less amount, the greatest quantity of any particular substance or gas that it can dissolve varying with its temperature. The solutions thus formed are of very great importance in horticulture, since it is in this form that plants absorb the elements found in their ash, and which are mostly essential to their support. These solutions of minerals in the soil are almost always extremely dilute. In such weak solutions minerals can be absorbed with much greater readiness by the root-hairs of plants than they could be were the solutions stronger, so that they are well suited to supply the requirements of plants. Some minerals—*e.g.*, Carbonate of Lime (whether in the form of marble or of chalk)—are scarcely, if at all, soluble in pure Water; but they become dissolved in water which has Carbonic Acid Gas already dissolved in it. Probably, no natural Waters are wholly deficient in this gas, and they can dissolve small quantities of even marble or Phosphates of Lime. The roots of plants can themselves also dissolve these minerals when in close contact with them. In all cases, the minerals necessary for the nutrition of the plants pass into them from the soil in these weak solutions. There is a constant passage of the fluids into the roots, and thence into the leaves, in order to replace the Water that is at all times escaping from all the green parts into the air in the form of invisible vapour.

The amount and nature of the water-supply for a garden is a matter of very great consequence; and it is necessary to inquire a little into the various natural sources from which it can be obtained, and the relative merits of the Water from each. The sources may be grouped under (1) rain, (2) ponds and streams, and (3) springs. Though it is impossible to draw sharply-defined distinctions between the Waters from these sources, yet they differ in several respects.

Rain is, in a sense, the source from which all Waters are derived, and from which all streams are fed; but the term Rain-water, in the ordinary sense, is restricted to that collected from the atmosphere—usually off the roofs of houses—and carried into a tank, in which it is stored till required. Pure Rain-water may contain a small quantity of Nitrates and Ammonia, which it dissolves out of the atmosphere, and carries with it to the earth. But, owing to the dust and impurities on the roofs or other surfaces from which it is usually collected, it always has also an appreciable, though very small, amount of various mineral substances dissolved in it; and is thus able to supply to plants at least a part of the mineral food that they require. It is fitted also to dissolve from the soil in which plants grow such substances as Carbonate of Lime, as it almost always contains a good deal of Carbonic Acid Gas, and also some Oxygen, dissolved while falling through the atmosphere. It is heated to the same average temperature as the air, so that in summer it helps to warm the soil to that temperature; and it thus stimulates the growth and power of absorption of the roots, and fits them to supply Water to the plants as quickly as it evaporates from the leaves. Rain-water is preferred for watering plants on account of its temperature being nearly the same as the air, and of the gases dissolved in it.

The Water in streams and in ponds contains a larger proportion of mineral substances than occurs in pure Rain-water, the gases are often present, only in smaller amount, and the average temperature — except in very shallow streams and ponds—is usually lower than that of the air in summer; and this is especially the case with Water conveyed from a distance in underground pipes.

Spring Water resembles that from streams in the amount

Water—*continued.*

of mineral substances in it; or it may even contain these substances in such amount that some of them, especially Carbonate of Lime, may be deposited in a crust on any bodies in the water, owing to evaporation of Carbonic Acid Gas from it, rendering it no longer able to keep them dissolved. Petrifying springs are of this nature. Some springs give Water that is actually injurious, as it contains compounds of Iron, or other substances that are poisonous to plants if present in more than very small amount. The Water from ordinary springs is almost always a good deal colder than the air in summer. If Water from streams, ponds, or springs is to be used in watering plants, it should be kept for some time previously in a tank small enough to allow of its being warmed to the ordinary temperature of the air in summer.

The amount of Water usually present in any soil has a very important influence on its fertility. Light soils with open, sandy subsoil are apt to suffer from want of Water; and a moderate drought may prove very prejudicial, or even fatal, to the plants cultivated in such. On the other hand, clays (and, in a less degree, other soils), over a close, impervious subsoil, retain Water too strongly, so that it stagnates; or they may allow the rain to run off the surface, and, if shallow, may actually suffer from want of Water during continued droughts, after the supply in the surface soil has evaporated. Light soils are much benefited by careful irrigation. Stiff soils, on the contrary, are usually in need of well-considered drainage. The latter operation is of wider utility than is recognised by many agriculturists. That it removes superfluous Water is obvious, and it is admitted by all that stagnant Water in the soil is hurtful to most plants, and in more ways than one. It promotes the formation, from decaying organic remains in the soil, of substances prejudicial to many plants; and where such substances are abundant, only certain weeds will grow. Waterlogged soils are deficient in the Oxygen that is required by roots to permit of the healthy discharge of their functions; the roots are unable to exist under the conditions present a few inches below the surface, or to penetrate deeply; the plants therefore are ill-nourished, as the roots spread less than in more open soils, and they derive their mineral food only from a limited area below the surface. In case of severe drought, the Water may all evaporate down to the depth reached by the roots, while the stiff subsoil prevents the passage of Water from below to take its place; and the plants cultivated on waterlogged land may thus die for lack of Water. Moreover, waterlogged soil is always considerably colder than the average temperature of the air, owing to the heat lost by the constant evaporation of Water from its surface. The crops cultivated on it are thus rendered backward in their growth, and may not reach maturity till a week, or even a fortnight, after those on well-drained soils. All this is changed when drains are well placed and well made, and the impervious subsoil is broken up. The rain no longer runs off the surface, nor does Water stagnate in the soil: it sinks into the subsoil, and there forms a reserve from which the surface soil can obtain supplies as required by the plants in it. The rain, while falling, becomes heated to the temperature of the air, or nearly so, and is thus able to warm the soil in sinking through it, and to supply the roots with Water at nearly the same temperature as the air — a condition most favourable to the due performance of the vital functions, and rapid and healthy growth in plants. Free evaporation from the soil is checked; and, this cause of coldness being removed, the crops are found to ripen earlier. As the rain sinks into the soil, the air follows into the interspaces vacated by the Water: thus the roots are supplied with the gases they require, and, as a result of this, and of the absence of the injurious organic substances formed in

Water—*continued.*

stagnant Water, they penetrate deep into the subsoils, beyond the reach of ordinary droughts. In this way they, at the same time, obtain a more reliable source of Water, and draw their food from a wider area.

The means by which Water enters plants, to form the crude sap, the changes that this undergoes, and the channels by which it is conveyed through the tissues, are treated of elsewhere in this work. *See* **Sap, Vascular System,** and **Vessels.**

WATER ALOE. A common name for **Stratiotes aloides** (which *see*).

WATER ANEMONE. A common name for **Ranunculus aquatilis** (which *see*).

WATER ARCHER. A common name for **Sagittaria sagittifolia** (which *see*).

WATER ASH, CAROLINA. *See* **Fraxinus platycarpa.**

WATER AVENS. *See* **Geum rivale.**

WATER BALSAM. *See* **Tytonia natans.**

WATER BEAN. *See* **Nelumbium.**

WATER BETONY. *See* **Scrophularia aquatica.**

WATER CALTROPS. *See* **Trapa natans.**

WATER CRESS. *See* **Cress, Water.**

WATER ELDER. *See* **Viburnum Opulus.**

WATERFALL. *See* **Cascade.**

WATER FLAG. *See* **Iris Pseudo-acorus.**

WATER GLADIOLE. A common name for **Butomus umbellatus** (which *see*).

WATERING. One of the most important operations in connection with the cultivation of plants, particularly those which are grown in pots and planted out in glass structures. It is an operation in daily practice at all seasons, and one which often requires the exercise of much judgment and care on the part of the operator. There are numerous subjects that may easily be injured, or even killed, by receiving either too much water, or an insufficient supply, and there are very few plants which do not suffer more or less by being watered indiscriminately at fixed periods, as their condition must vary according to the amount of evaporation which is taking place, and the quantity of roots that are absorbing the moisture supplied. It is not possible to do more than refer to Watering in somewhat general terms, as individual plants have often to receive special attention in regard to it, and different species in a genus also sometimes require totally different treatment in the matter of watering. As a rule, soft-wooded plants, and all those of quick growth, require more water than others of a slow-growing or hard-wooded nature; but exceptions may not unfrequently be found. Seasons of growth and of rest have also to be dealt with, and the supply of water given accordingly. Soft rain-water is always the best for plants of every description; provision should, therefore, be made for collecting and preserving as much as possible for future use from the roofs of glass and other structures. Water should not be applied to plants at a lower temperature than that to which they are at the time subjected; particularly does this remark apply to such as are grown in heat, or are being subjected to forcing under glass. Even upon plants established in the open ground, cold water has an injurious effect during summer time if applied direct from springs or wells; it becomes efficiently warmed in large, open tanks, streams, &c., exposed to the sun and air, hence one of these sources is most desirable.

Plants in pots, when they require Watering, should be well soaked, not slightly damped; it may not, in every

Watering—*continued.*

instance, be necessary to keep Watering daily, but surface sprinklings are always to be avoided. The amount of water and the frequency of its application are matters which can only be known from personal experience in dealing with various subjects under cultivation: some require it, in summer, two or three times a day, while others would be ruined were they similarly treated. The time when water is likely to be needed should be anticipated somewhat, so as to avoid having to give it more than is really necessary during sunshine in the middle part of a hot day. In summer, Watering should be proceeded with early in the morning if it is known that the plants will require a supply before the afternoon, the general Watering being given when it is nearly time to reduce the air for the day. Should it become necessary to water in the day-time, a supply should be procured of a temperature equally warm to that in which the plants are growing. Occasionally, a specimen will get overlooked, and will show signs of flagging; it should then be stood in a pail of water until well soaked, and kept shaded for the remainder of the day. In winter, it is generally very desirable to have the foliage of most plants dry at night. Watering is, therefore, best done in the morning only; not that it is always necessary to wet the foliage, but because of the moisture that must be caused by waste on the stages, &c.

The necessity for Watering trees, shrubs, &c., outside, of course depends on the seasons and other circumstances, such as recent transplanting, &c. Whenever the operation becomes necessary, it is always best to give copious supplies, and then to mulch the surface with some dry, light material, as this tends to prevent undue evaporation. This method of management is also applicable in summer to fruit-trees, and, indeed, crops of any kind, indoors or out, that are planted in the ground, and require plentiful supplies of water at the roots.

WATERING-POTS. These, in various sizes, are requisite where there are many kinds of plants to be kept watered. For trees of all kinds, shrubs, outside garden crops, &c., the ordinary kind, with coarse rose, is well adapted, but the use of the rose is not always necessary. A pot holding from twelve to sixteen quarts is quite large enough for carrying and managing when full; the latter capacity being an extreme limit. Pots of smaller sizes are necessary for watering indoor plants, and these are better managed when the spouts are made longer in proportion than in the larger sizes. Sizes each holding two, three, four, five, and six quarts of water are adapted for use with long spouts; these prove most serviceable where plants have to be reached at a considerable distance from the person who is watering. It is sometimes an advantage to have the end of the spout bent downwards, at about a right angle, where the rose is fixed, as the water runs without lifting the can up so high. For watering beds, pots, or pans, where small seeds have been sown, a very fine rose is necessary, and it should fit the spout so that all drip is prevented: this is best insured by having the rose made of brass, so that it can be readily screwed on or taken off as desired. If the same thread is used, several roses, perforated to various degrees of fineness to suit the plants or seeds that are watered, can be employed for screwing on a can. Watering-pots specially intended for Strawberries in spring are not furnished with a cross handle over the top; they hold about two quarts of water, and are provided with long spouts for the purpose of watering the plants referred to, when situated rather closely together, and on shelves near the glass. Watering-pots are usually either japanned, painted red or green, or galvanised in a similar way to ordinary cisterns. If the whole surface is properly galvanised inside and out, there is no danger of rusting, and Watering-pots made of galvanised iron are very strong and durable.

WATER LEMON. *See* **Passiflora laurifolia.**

WATER LENTILS. A common name for **Lemna** (which *see*).

WATER LETTUCE. *See* **Pistia Stratiotes.**

WATER LILY. A common name for various species of *Euryale*, *Nuphar*, *Nymphæa*, *Victoria*, and *Villarsia*.

WATER MELON. *See* **Citrullus vulgaris.**

WATER MILFOIL. *See* **Myriophyllum.**

WATER OAK. *See* **Quercus aquatica.**

WATER PARSNIP. *See* **Sium.**

WATER PLANTS. A general term applied to all plants which grow in water, both in and outdoors. Perhaps the most familiar of all are Nuphars and Nymphæas. With these the following, amongst many others, may be associated, but some require a greater depth of water than others: *Acorus Calamus*, *Alisma Plantago*, *Aponogeton distachyon*, *Butomus umbellatus*, *Calla palustris*, *Hottonia palustris*, *Limnanthemum nymphæoides*, *Pontederia cordata*, Sagittarias, *Stratiotes aloides*, *Trapa natans*, *Typha angustifolia* and *T. latifolia*, and *Vallisneria spiralis* (indoors).

WATER SOLDIER. *See* **Stratiotes aloides.**

WATER SPIKE. An old name for *Potamogeton.*

WATER THYME. *See* **Elodea.**

WATER VIOLET. *See* **Hottonia palustris.**

WATER WHITE OAK. *See* **Quercus lyrata.**

WATSONIA (named after W. Watson, 1715-1787, Professor of Botany at Chelsea). Bugle Lily. SYNS. *Meriana*, *Neuberia*. ORD. *Irideæ*. A genus comprising according to Klatt twenty-five, according to Baker eleven, species of greenhouse, bulbous plants, confined to South Africa. Flowers one to a spathe, sessile; perianth tube curved or recurved, the lobes sub-equal, ovate, oblong, or lanceolate; stamens affixed within the throat; filaments free, filiform, rather long; spathes lanceolate, oblong, or narrow, often numerous, scattered or somewhat imbricated; spikes long, simple or slightly branched. Leaves long, ensiform, rather rigid, veined, the midrib usually prominent. Stem frequently tall. Watsonias are very pretty subjects when in flower. They require a mixture of very sandy loam and a little peat. If planted out in a pit or frame, where protection from frost can be ensured, they will flower much stronger than if kept in pots. Little or no water should be given during the resting season. Propagation may be effected by offsets, or by seeds.

W. aletroides (Aletris-like). *fl.* seven to twelve crowded in a spike, drooping; perianth scarlet, the tube 1in. long, the segments acute, ½in. long; spathes ten lines long; scape terete, simple, leafy, 1ft. to 2ft. high. June. *l.* linear-ensiform, thick, acute, shorter than the scape, ½in. broad, margined and ribbed with yellow. 1774. (B. M. 533.) SYN. *Antholyza Merianella* (B. M. 441).

W. angusta (narrow). *fl.* eight to twenty-four, densely imbricate-spicate, distichous; perianth brilliant scarlet, 2in. long, the segments oval-oblong, much spreading; spathes purple, scarious, seven lines long; scape simple or branched, erect, terete, spathiform-leafy. June. *l.* distichous, lanceolate-ensiform, acute, 1in. broad, much striated. 1825. SYNS. *W. iridifolia fulgens* (B. M. 600; F. d. S. 1077), *Antholyza fulgens* (A. B. R. 192).

W. brevifolia (short-leaved). *fl.* eight to fifteen, imbricate-spicate, distichous or secund; perianth scarlet, 1in. long, the tube twisted, curved, the segments regularly spreading, mucronate; spathes unequal-valved, the inner valves bifid at apex; scape erect, simple, 9in. to 15in. high. May. *l.*, cauline ones spathe-like; radical ones broadly or narrowly linear-ensiform, distichous, cuspidate, ribbed and margined, two to seven lines broad. 1794. (B. M. 601.) SYN. *Antholyza spicata* (A. B. R. 56).

W. densiflora (dense-flowered).* *fl.* in a dense, distichous spike; perianth rose-red, the tube 1½in. long, the spreading, lanceolate, acute segments ½in. to ¾in. long; scape as long as the leaves, covered with numerous reduced leaves. June. *l.* erect, linear,

Watsonia—*continued.*

rigid, 1½ft. to 2ft. long, ½in. broad, with several strong ribs, and a thickened, straw-coloured margin. 1879. A fine, well-marked species. (B. M. 6400.)

W. humilis (dwarf). *fl.* five in a distichous spike; perianth rose-coloured, 2in. long, the segments regular, oblong-ovate, acute; spathes equal-valved, equalling the perianth tube; scape simple, terete-angled, 8in. to 12in. high. June. *l.* lanceolate-ensiform, straight, acute, ribbed and margined, distichous, shorter than the scape, one to two lines broad. 1754. (B. M. 631.)

W. iridifolia fulgens (Iris-leaved, brilliant). A synonym of *W. angusta.*

W. marginata (conspicuous-margined). *fl.* ten, slightly imbricated, distichous, nodding; perianth pink, 1¼in. long, the segments obovate-elliptic, mucronate; spathes nearly equal-valved, ¾in. long; spikes several; scape terete, simple, nearly 2ft. high. July. *l.* lanceolate-ensiform, slightly coriaceous, thickly ribbed and margined, cuspidate, shorter than the scape, ½in. broad, glaucescent. (B. M. 608.)

W. m. minor (lesser). *fl.* of a beautiful pink; spike solitary. *l.* rather dark green, lucid, obscurely cartilaginous on the margins. (B. M. 1530.)

W. Meriana (Madam Merian's).* *fl.* three to nine, distichous; perianth purple or scarlet, somewhat salver-shaped, the throat cucullate-cylindrical, 1in. long, the segments obovate-oblong, acuminate, 1in. long; outer spathe valves purple, striated, 1½in. long, the inner ones bifid, 1½in. long; scape terete-angled, striated, simple or branched, 9in. to 2ft. high. May. *l.* lanceolate-ensiform, thick, much striated, margined, acute, two to six lines broad. 1750. SYN. *Antholyza Meriana* (B. M. 418).

W. M. coccinea (scarlet). *fl.* five to eight; perianth scarlet, 2½in. long; scape 1ft. to 2ft. or more high. A splendid variety. (B. M. 1194.)

W. M. iridifolia (Iris-leaved). *fl.*, perianth white, funnel-shaped, eleven lines long; scape 3ft. high. *l.* broadly lanceolate-ensiform, acute, shorter than the scape, 1½in. broad.

W. M. roseo-alba (pink and white). *fl.* twenty-four, densely imbricate-spicate; perianth pink and white, 2½in. long; scape 2ft. to 3ft. high. *l.* broadly linear-ensiform, 1½in. wide, shorter than the scape. (B. M. 537 and 1193, under names of *W. roseo-alba* and var.)

W. punctata (dotted). *fl.*, perianth scarlet or violet, funnel-shaped, 1¼in. long, the tube erect, filiform, the segments ovate-lanceolate, lined; outer spathe valves ferruginous, ¾in. broad, the inner ones bifid, ½in. broad; scape terete, erect, 4in. to 15in. high. June. *l.* three, linear-compressed or terete, slightly furrowed, sheathing at base. 1800. SYN. *Ixia punctata* (A. B. R. 177)

W. rosea (rose-coloured).* *fl.* crowded in a paniculate, elongated-pyramidal spike; perianth rose-coloured, sub-campanulate, nearly 2in. long, the throat broadly turbinate, the segments mucronate; spathes purple, five lines long; scape terete, simple or branched, nearly 2ft. high. July. *l.* broadly lanceolate-ensiform, 1in. broad, cartilaginous-margined, striated, acute. 1803. (B. M. 1072.) SYN. *Gladiolus pyramidatus* (A. B. R. 335).

W. strictiflora (straight-flowered). *fl.* scentless; perianth cherry-red, about 3in. long, the tube quite straight, the opening of the throat marked with a violet-purple star of six rays; scape taller than the leaves, simple. June. *l.* linear-ensiform, rather rigid, 4in. to 6in. long, about ½in. broad. Bulb the size of a large nutmeg. 1810. (B. M. 1406.)

WATTLE. A name applied to various species of *Acacia* and *Citharexylum.*

WAX DAMMAR. A common name for **Podocarpus neriifolia** (which *see*).

WAX FLOWER. *See* **Hoya.**

WAX FLOWER, CLUSTERED. *See* **Stephanotis floribunda.**

WAX, GRAFTING. *See* **Grafting Wax.**

WAX MYRTLE. A common name for **Myrica cerifera** (which *see*).

WAX PALM (of Brazil). *See* **Copernicia cerifera.**

WAX-PLANT. A common name for **Cerinthe major** (which *see*).

WAX-TREE. A common name for **Vismia guianensis** (which *see*).

WAY BREAD. An old name for *Plantago.*

WAYFARING-TREE. *See* **Viburnum Lantana.**

WEASEL (*Mustela vulgaris*). Many persons regard Weasels as noxious animals that should be killed on every possible opportunity; but they are most valuable in gardens by destroying all kinds of mice. The latter are often very hurtful, as they eat peas and other seeds, and gnaw the bark or the roots of choice trees and shrubs. Hence Weasels deserve protection in gardens, although it cannot be denied that they are occasionally destructive where fowls are kept.

WEATHER. The relation of the Weather to gardening, and its effect upon garden crops, are matters often too well known, especially when the results are unsatisfactory. Still, it is important for gardeners to be continually studying the subject, with a view to adapting themselves to circumstances by taking advantage of every help which the Weather affords, and at the same time using precautions, so far as possible, for preventing it from doing injury. Those who would manage gardens successfully must always be looking ahead, and anticipating what is likely to come later on, as well as directing their attention to making provision for the present. Thus, what is likely to occur during the day needs consideration in the morning, and provision for the night must invariably be made the previous evening. The Weather affects outside vegetation and crops according to locality and the nature of soil and subsoil. Where the latter is gravelly, the effects of drought are most readily felt, while a clayey subsoil has naturally a tendency to hold more moisture, and is, consequently, not favoured by very wet seasons. In regard to the important work of transplanting of any kind, the state of the Weather must be the first consideration, coupled with the proper season for performing the work. Very dry Weather is always unfavourable for any transplanting. Watering may be ever so well attended to, yet if there is a constant and rapid evaporation taking place its effects are not much marked. Mild, moist Weather should therefore be selected for this work; it must even be waited for a long time in some seasons before crops can be transplanted and safely re-established. Due advantage should be taken of frosty Weather, when the ground is hard, for executing such work as wheeling manure, &c., into places that cannot be well reached when walks and the ground are loose. In snowy Weather, when outside work has often to be suspended, everything that can be forwarded in sheds should receive full attention. Digging should not be proceeded with while the ground is frosty, neither should snow be buried by the same operation. In garden management, the work must, to a certain extent, be arranged each day according as the Weather allows; the seasons too, which are very variable, will need to be studied, and work managed according as circumstances depending on these, and the changes of Weather, will admit. In the management of glass structures and pot plants generally, attention to the changeableness of the weather is of much more importance than to plants, &c., outside. A properly-constructed glasshouse will quickly be affected by a rise or fall of temperature caused by the Weather outside; and as the inside occupants are frequently very tender, and incapable of bearing with impunity what hardier subjects outside can withstand, the conditions necessary for their well-being have to receive constant and daily attention. The chief point to be impressed is that of adopting a system of management which shall utilise every opportunity of forwarding operations, so far as may be practicable, be the climatic conditions whatever they may. To do everything at the proper time, is equally important in this as in all other matters. In gardening, it can only be effected by a considerable amount of forethought on the part of those in charge, coupled with practical experience, to know what cultivated plants require, and by daily attention, which has to be constantly varied to meet exigencies caused by an ever-changing climate.

WEBBIA. Included under **Vernonia** (which *see*).

WEBERA (named in honour of George Henry Weber, 1752-1828, Professor at Kiel, and author of various Floras). SYNS. *Ceriscus*, *Chomelia* (of Linnæus), *Stylocoryne* (of Wight and Arnott), *Tarenna*, *Wahlenbergia* (of Blume). ORD. *Rubiaceæ*. A genus comprising about forty species of stove trees and shrubs, inhabiting tropical Asia, Polynesia, Africa, and (one species) Australia. Flowers in terminal, corymbiform cymes, sessile and bibracteolate at the ovary, or pedicellate and bracteolate on the pedicel; calyx tube ovoid or turbinate, the limb five, rarely four, cleft or parted; corolla funnel- or salver-shaped, with five, rarely four, narrow, spreading or reflexed lobes, twisted in bud; stamens five, rarely four, on the mouth of the corolla; filaments short or wanting. Leaves opposite, petiolate, often oblong-lanceolate; stipules triangular-ovate, usually deciduous. Only one species calls for description here. For culture, *see* **Vangueria.**

W. corymbosa (corymbose). *fl.* white, faintly odorous; corolla ¼in. to ⅜in. in diameter, the tube broad, about equalling the lobes; cymes variable in size. Summer. *l.* elliptic- or oblong-lanceolate, acute or acuminate, 3in. to 8in. long, shining above, often glaucous beneath; petioles short, stout. India. A glabrous shrub or small tree. (B. R. 119.)

WEB-FORMING CATERPILLARS. Almost all the Caterpillars of Butterflies, Moths, and Sawflies can spin silken threads when required; but many of them hardly do so except to form a cocoon, for the protection of the pupæ; while many do not even spin a cocoon. Many larvæ spin together several leaves to form a protection for themselves against birds or other foes, or they draw a leaf into a tubular form, with the same object, keeping it in position by silken threads. The Web-formers are not very numerous, though they belong to widely different groups of *Lepidoptera*. Several of them live on Hawthorn leaves, such as the Black-veined White Butterfly (*Aporia Cratægi*), the small Ermine Moths (*Hyponomeuta padella*, &c.), and Sawflies of the genus *Lyda* (*e.g.*, *L. punctata*). The larvæ of these insects, when young (or during their whole life as larvæ), live in webs spun by a number of them in common, sometimes over a whole branch, but usually over several leaves. Some form separate silken tubes for themselves inside the webs; others are contented with the protection afforded by the web alone. An account of the several insects just mentioned is given under the heading **Hawthorn Caterpillars.**

The larvæ of various European and exotic Moths form much more striking and conspicuous webs than do the British species—*e.g.*, the Processionary Moth (*Cnethocampa processionea*), which feeds on Oaks in Germany. The larvæ spin a web, on which they lie, and, when going to feed, they march in a regular procession—first one, then two, then three, and so on, those in each line moving side by side, till they reach suitable food, when they disperse and eat what they require, and thereafter return to the web in the same regular order. When full-fed, they spin a compact web, under cover of which they form their separate cocoons to protect themselves while they are pupæ.

Remedies. Web-forming Caterpillars are easily got rid of by tearing down the webs, or cutting off the branches, and destroying the larvæ.

WEDELIA (named in compliment to George Wolfgang Wedel, 1645-1721, a German botanist, Professor at Jena). Including *Wollastonia*. ORD. *Compositæ*. A genus embracing about forty-five species of stove, greenhouse, or hardy, scabrous-pubescent or hirsute, annual or perennial herbs or sub-shrubs, inhabiting the warmer parts of the globe. Flower-heads yellow, pedunculate, at the tips of the branches or in the upper axils, heterogamous; involucral bracts sub-biseriate, the outer three to five usually herbaceous or leafy, the inner dry; receptacle flat or convex, the pales inclosing the florets; ray florets ligulate,

Wedelia—*continued.*

entire, or two or three-toothed at apex; disk florets five-toothed or shortly five-cleft; achenes smooth or tubercled. Leaves opposite, often toothed, rarely trifid or entire. The species are mostly interesting from a botanical standpoint only. Those described below thrive in any fairly good soil. *W. hispida* may be increased by seeds or by divisions, and *W. radiosa* by seeds or by cuttings.

W. aurea (golden). A synonym of *Zexmenia aurea*.

W. hispida (hispid). *fl.-heads* one to a peduncle; outer involucral scales hairy, the inner ones nearly glabrous. June. *l.* lanceolate or somewhat obovate-lanceolate, cuneate at base, acuminate at apex, cut-toothed, hairy. Branches erect, hispid. *h.* 1½ft. Mexico, &c., 1819. Half-hardy perennial. (B. R. 543.) SYN. *Zexmenia texana*.

W. radiosa (rayed). *fl.-heads* one to three on peduncles longer than the leaves; involucral scales in three series, the outer ones leafy, the inner membranous. June. *l.* petiolate, ovate- or oblong-lanceolate, acute, serrulated, puberulous. *h.* 2ft. Brazil, 1820. Greenhouse sub-shrub. (B. R. 610.)

WEDGE-GRAFTING. *See* **Grafting.**

WEEDS AND WEEDING. Weeds abound in every direction on cultivated land, and wherever there is any kind of soil in which their roots can receive the least encouragement and support. It is sometimes remarked in reference to a piece of land that "Weeds won't grow on it," and this is readily understood as referring to its uselessness for gardening. The length of time during which the seeds of many common Weeds retain their germinative powers is remarkable when, from the removal of ground, or other causes, they become buried too deep to grow until brought again under the more immediate influence of the atmosphere. The rapidity with which soil newly upturned after a long period becomes covered with Weeds will often come under notice, suggesting the existence of seeds which grow only when placed under suitable conditions. Amongst Weeds that, once established, are only with great difficulty eradicated, are Chickweed, Couch Grass, Dandelions, Groundsel, Plantains, and Thistles. The destruction of all these before their seeds ripen, and the frequent use of the hoe during dry weather, are the best plans of preventing their increase. Hand-weeding is the most effectual mode of eradication where there are tap-roots, as in Dandelions, Plantains, and Thistles. The roots of these plants, if left in the ground, will frequently form new crowns in a short time, and grow again. Hand-weeding is also the most certain plan of keeping walks clean; it should be attended to whenever the surface is moist, and everything pulled up should be burned, or put where the seeds are not likely to ripen and sow themselves. Proper Weeding-knives should always be provided along with other garden tools; the work is more readily executed with these than with old knives of other kinds, that are often made to do service. For destroying on a large scale Weeds in walks, salt may be effectually employed, scattered with the hand over the surface, during dry weather, in summer. Smith's Weed-killer, a preparation specially made for walks, has been highly spoken of. Any "destroyer" of Weeds applied to walks must be kept clear of grass and other living edges, and care must also be taken to avoid stepping from a walk on to the grass at the time when a preparation destructive to plant life is being employed.

WEED-WIND, or **WITH-WIND.** An old name for Bindweed (*Convolvulus*).

WEEPING ARBOR-VITÆ. *See* **Thuya orientalis pendula.**

WEEPING ASH. *See* **Fraxinus excelsior pendula.**

WEEPING BEECH. *See* **Fagus sylvatica pendula.**

WEEPING CHERRY. *See* **Cerasus semperflorens.**

WEEPING ELM. *See* **Ulmus glabra pendula** and **U. montana pendula.**

WEEPING MOUNTAIN ASH. *See* **Pyrus Aucuparia pendula.**

WEEPING OAK. *See* **Quercus pedunculata pendula.**

WEEPING POPLAR. *See* **Populus grandidentata pendula** and **P. Tremula pendula.**

WEEPING RED CEDAR. *See* **Juniperus virginiana pendula.**

WEEPING WILLOW. *See* **Salix babylonica.**

WEEVIL-PLANT. A common name for **Curculigo** (which *see*).

WEEVILS. The popular name for a large division of Beetles, of very great interest to the gardener and the farmer, because of the injury inflicted by many species on garden and field produce. There has been frequent occasion, in the course of this work, to refer to their ravages under various headings, the more important of which are mentioned below. The scientific name of the Weevils is *Rhynchophora* (from the Greek words *rhynchos*, a snout, and *phero*, I carry). This name bears reference to the most characteristic mark of the Weevils, viz., that the head is prolonged and narrowed forwards into a snout, on which the antennæ are placed. The snout, or beak, in many is short and flattened; but in a few (*e.g.*, Nut-Weevil) it is very long, slender, and curved abruptly downwards. The mouth is at the end of the beak. The antennæ are very generally elbowed—*i.e.*, the basal joint is long and slender, and the others are short, and form a row, attached to the tip of the basal joint at an angle with it. Few Weevils of temperate climates are large; most are very small. The body is very often short, rounded, and very hard, less often slender and elongate, or depressed and flattened. Like other Beetles, they undergo a complete metamorphosis, their larvæ being usually white, fleshy, legless grubs, with the head horny, dark, and furnished with strong jaws. Many of them live in the interior of fruits, or of seeds, but others burrow in leaves, or in the wood or pith of twigs, or in galls. The Beetles themselves are frequently destructive, gnawing the leaves, bark, or fruits of garden herbs and shrubs. The habits of the larvæ and of the Beetles are thus so varied, and the injuries done by them so manifold, that it would exceed our limits to enter into the full details here; but information on these points in regard to the more important species will be found under the following headings: **Apple-blossom Weevil, Bean Beetle, Cabbage Gall Weevil, Nut Weevil, Orchestes, Otiorhynchus, Pea** (INSECT PESTS), **Pine-bark Beetle, Pine Weevils, Plum** (INSECT PESTS), **Raspberry** (INSECTS), **Rhynchites, Scolytidæ, Sitona,** and **Turnip-Seed Weevil.**

WEIGELIA (also spelt *Weigela*). This is now regarded, by the authors of the "Genera Plantarum," as synonymous with **Diervilla** (which *see*). The correct name of *W. rosea* (see Fig. 216) is *Diervilla rosea*, and *W. rosea monstrosa* (see Fig. 217) is now correctly named *D. rosea monstrosa*.

Weigelia—*continued.*

FIG. 216. SEEDLING PLANT OF WEIGELIA (DIERVILLA) ROSEA IN FLOWER.

FIG. 217. WEIGELIA (DIERVILLA) ROSEA MONSTROSA.

WEINMANNIA (named after John William Weinmann, apothecary at Ratisbon, author of "Phytanthozaiconographica," 1737). SYN. *Leiospermum*. ORD. *Saxifrageæ*. A genus embracing about fifty species of stove or greenhouse, glabrous or tomentose trees or shrubs, inhabiting the Malayan Peninsula and Islands, the Mascarene and Pacific Islands, Australia, New Zealand, and tropical and temperate South America. Flowers white, small, fascicled or scattered, disposed in simple, terminal and axillary, erect racemes; calyx tube short, the limb four or five-partite; petals four or five, spathulate or ovate, sessile; stamens eight or ten, inserted with the petals. Leaves opposite, coriaceous, petiolate, simple, trifoliolate, or imparipinnate; leaflets usually glandular-serrated; rachis often winged; stipules variable, deciduous. Branchlets opposite, often terete. A selection of the introduced species is here given. They

Weinmannia—*continued.*

all require stove treatment, and thrive in any light, rich soil. Propagation may be effected by cuttings, inserted in sandy soil, under a glass, in heat.

W. glabra (smooth). *fl.* white; petals rather longer than the calyx segments; pedicels twin, shortly hirsute. January. *l.* highly glabrous on both sides, shortly petiolate, imparipinnate; leaflets three to five pairs, oblong-elliptic, slightly acute at base, the margins serrate or crenate-serrate, sometimes nearly entire. *h.* 6ft. Jamaica, 1815. Shrub.

W. hirta (hairy). *fl.* fascicled-racemose; stamens eight, exserted. May. *l.*, leaflets three or four-jugal, six to ten lines long, elliptic, bluish, serrated above the base, pilose-pubescent chiefly beneath. Branchlets villous-hirsute. *h.* 6ft. or more. Jamaica, 1820. Tree or shrub.

W. ovata (ovate-leaved). *fl.*, fascicles few-flowered, remote; racemes very loose, 3in. long. May. *l.* elliptic-oblong, somewhat obtuse, acute at base, crenate, 2in. to 3in. long, 1in. to 1½in. broad; petioles two to three lines long. *h.* 6ft. Peru, 1824. Glabrous tree.

W. pinnata (pinnate). *fl.* fascicled-racemose; stamens eight, exserted. May. *l.*, leaflets three to seven-jugal, elliptic-oblong, bluish, four to eight lines long, serrated above the base, hispid on the midrib beneath, or glabrescent. Branchlets hirsute with short down. *h.* 6ft. and upwards. Jamaica, 1815. Tree. *W. glabra* is (in part) synonymous with this species.

W. trichosperma (hairy-seeded). *fl.*, raceme loose. May. *l.* pinnate; leaflets many, oblong, acute, toothed, obliquely cuneate at base, naked and shining above, slightly pilose beneath. *h.* 4ft. Valdivia. Shrub.

W. trifoliata (three-leafleted). A synonym of *Platylophus trifoliata.*

WELFIA (named in honour of the Royal Family [Guelph] of Hanover). ORD. *Palmæ.* A small genus (two species) of stove, unarmed Palms, natives of Central America. Flowers pale yellowish-white, rather large; spathes two, deciduous; spadices thick, pendulous. Fruit dark violet, oblong, compressed, 2in. long. Leaves terminal, pinnatisect, on rather flat, short petioles; segments much narrowed at base, entire or cut at apex. *W. regia*, the only species introduced, should be grown in a compost of rich loam and leaf mould, mixed with a little old cow-dung. Propagation may be effected by seeds.

W. regia (royal).* *l.* in the young state divided almost to the base into a pair of oblong, acuminate lobes, having a pretty bronzy tint, borne on slender petioles, at length becoming pinnatisect; margins of the segments recurved at base; adult leaves with numerous unequal, narrow pinnæ, decurrent on the angular rachis, whitish beneath. When fully grown, the stem attains a height of 60ft., and the leaves a length of about 20ft. New Grenada, 1869. (G. C. 1870, 764; F. M. n. s. 60; I. H. n. s. 62.)

WELL. A Well is not a desirable source for procuring water to give plants, as the water is invariably colder than the temperature and the soil in which the roots are situated. If, however, there is no other efficient supply, a quantity should be drawn or pumped up some time previous to being required for use, and meanwhile allowed to stand in an open tank. Well-water is also, as a rule, harder than rain-water, and is, consequently, not so well suited for administering to plants. *See also* **Water.**

WELLINGTONIA. A synonym of **Sequoia** (which *see*).

WELSH NUT. A common name for the **Walnut** (which *see*).

WELSH POPPY. *See* **Meconopsis cambrica.**

WELWITSCHIA (named in honour of Dr. Frederic Welwitsch, 1806-1872, a celebrated botanical traveller). SYN. *Tumboa.* ORD. *Gnetaceæ.* A monotypic genus. The species is one of the most remarkable productions of the vegetable kingdom. It is found growing in arid places in tropical and South-western Africa, where rain rarely falls. The two leaves were at first described as being simply persistent cotyledons enormously developed, but such is not the case; the two cotyledons last for some time, and then the true leaves appear. Although *W. mirabilis* "was

Welwitschia—*continued.*

first made known in Europe by Dr. Welwitsch, it appears to have been first discovered by Mr. C. J. Anderson, an eminent African traveller. This wonderful plant has been introduced into the Royal Gardens, Kew; but we do not know if it yet exists in any other establishment. It will probably prove very difficult to cultivate, on account of the impossibility of imitating the natural conditions under which it flourishes. It appears to us that the most probable method of succeeding with it would be to inclose a space within brick walls to a height of about 3ft. from the earth. This should be filled up, to a height of about 16in. or 18in., with a very light, porous soil, such as a mixture of light, sandy loam and broken bricks, in the proportion of two parts of the former to one of the latter. Above this the space should be filled in with sand and brick rubbish, mixed with a little sandy loam—about a tenth part of the latter, just to help to bind it. If planted in this way, the long, descending roots would penetrate into the lower soil, and derive sufficient nourishment and water from it, as the water would ascend into the lower stratum from the earth by capillary attraction, whilst the upper stratum being dry would prevent the plant from rotting. It should be fully exposed to the sun, and no water given it, though at evening a slight syringing over the leaves and crown would probably be beneficial, as this would in some way approach the dews to which it is subjected in its native country. The temperature should not be allowed to get below 50deg." (N. E. Brown).

W. mirabilis (wonderful). *fl.* solitary, contained within the scales of the young cones; cones scarlet, small, erect, at length oblong, in stout, dichotomously branched cymes, springing from near the insertion of the leaves. *l.* two, from deep grooves in the circumference of the trunk, 6ft. or more in length, quite flat, linear, very leathery, splitting with age into innumerable thongs, that lie curling on the surface of the soil. Trunk obconical, about 2ft. long, rising a few inches only above the soil, with the appearance of a flat, two-lobed, depressed mass, sometimes 14ft. in circumference; when fully grown, it is dark brown, hard, and cracked, like the burnt crust of a loaf of bread; the lower part forming a stout tap-root, buried in the soil, and branching downwards at the end. 1862 and 1878. The plant is said to last a century. (B. M. 5368-9; T. L. S. xxiv. 1-14.)

WENDLANDIA (named in honour of Henry Ludovicus Wendland, 1755-1828, once Curator of the Botanic Garden at Hanover). ORD. *Rubiaceæ.* A genus comprising about sixteen species of stove or greenhouse shrubs or small trees, inhabiting tropical and sub-tropical Asia. Flowers white, pink, or yellow, small, two or three-bracteolate, sessile or pedicellate in terminal, thyrsoid, densely many-flowered panicles; calyx lobes four or five, small; corolla tubular, salver or funnel-shaped, the lobes four or five, imbricated in bud; stamens four or five, between the corolla lobes. Leaves opposite or ternately whorled; stipules entire or bifid. For culture of the two best-known species, *see* **Vangueria.** Both are stove trees.

W. paniculata (panicled). *fl.* as in *W. tinctoria*; panicle ample. July. *l.* opposite, elliptic or elliptic-lanceolate, acuminate, 5in. to 8in. long, rarely narrow-obovate, more or less pubescent beneath; stipules recurved, broad, orbicular or oblong, with rounded tips. *h.* 6ft. India, 1820.

W. tinctoria (dyer's). *fl.* white, sessile, fascicled; panicles large, spreading, pubescent, pilose, or tomentose. July. *l.* opposite, elliptic, ovate, or obovate, 4in. to 8in. long, acuminate, glabrous and often shining above, paler and pubescent or rarely glabrous beneath; stipules erect, large, with a subulate point or a laterally-flattened, rigid appendage. *h.* 6ft. India, 1825.

WENDLANDIA (of Willdenow). A synonym of **Cocculus** (which *see*).

WENSEA. A synonym of **Pogostemon** (which *see*).

WERNERIA (named in honour of A. G. Werner, 1750-1817, Professor of Mineralogy at Friburg). ORD. *Compositæ.* A genus embracing about seventeen species of dwarf, tufted, greenhouse, perennial herbs, natives of the Andes of South America. Flower-heads large or

Werneria—*continued.*

mediocre, heterogamous; involucre broadly campanulate or hemispherical, with one series of bracts; receptacle flat or convex, naked; ray florets pink, yellow, or white, in one series, ligulate; disk yellow; achenes oblong or turbinate. Leaves radical or clustered on the stem, entire or rarely toothed or pinnatisect. Only one species is known to gardeners. It thrives in light soil, and may be increased by division of the roots.

W. frigida (frigid). *fl.-heads* yellow, solitary, shortly pedunculate; involucre about thirteen-cleft, coloured. February. *l.* stellate, imbricated, linear, obtuse. *h.* 9in. Quito, 1828.

WESTERN YEW. *See* **Taxus brevifolia.**

WEST INDIAN COCKSPUR. *See* **Pisonia aculeata.**

WEST INDIAN MUGWORT. *See* **Parthenium Hysterophorus.**

WESTRINGIA (named in honour of J. P. Westring, a physician to the King of Sweden). ORD. *Labiatæ.* A genus comprising about eleven species of greenhouse shrubs, broadly dispersed over extra-tropical Australia. Flowers all axillary or rarely in terminal, leafy heads, with a pair of bracts under the calyx, usually very small and sometimes obsolete; calyx campanulate, five-toothed; corolla with a short tube, usually hairy inside, and a dilated throat, the upper lip erect but flat and broadly two-lobed, the lower one spreading, three-lobed; two upper stamens perfect, the two lower ones sterile. Leaves in whorls of three, four, or rarely more. The best-known species are here described. They thrive in any light, rich soil. Propagation may be readily effected by young cuttings, inserted in sand, under a glass.

W. angustifolia (narrow-leaved). A synonym of *W. rigida.*

W. cinerea (grey). A form of *W. rigida.*

W. Dampieri (Dampier's). *fl.* white, nearly sessile, about the size of those of *W. rosmariniformis*, but the corolla more hirsute. September. *l.* in whorls of four, or very rarely three, on the side branches, linear, much revolute, usually about ½in. long, smooth or scabrous above, often hoary beneath. *h.* several feet. 1803. (B. M. 3308.)

W. eremicola (desert-loving). *fl.* pale blue, rather small, usually distant; calyx hoary; corolla pubescent. June. *l.* usually in whorls of three, narrow-linear, acute or mucronate, rarely above ¼in. long. Branches erect, often twiggy, more or less hoary or silky-pubescent. *h.* 3ft. 1823. (B. M. 3438; B. R. 1481, under name of *W. longifolia.*)

W. longifolia (long-leaved). *fl.* lilac, rather small, axillary; corolla pubescent outside, the tube usually exceeding the calyx teeth. Summer. *l.* in whorls of three, narrow-linear, mostly above 1in. long, the margins somewhat revolute or nearly flat. *h.* several feet. 1878.

W. rigida (rigid). *fl.* as in *W. Dampieri. l.* mostly in whorls of three, but here and there four, linear, obtuse or mucronate-acute, rigid, with much-revolute margins, usually glabrous above when full-grown, and either smooth and shining or scabrous with minute tubercles, hoary beneath. *h.* 3ft. 1823. SYN. *W. angustifolia. W. cinerea* is a more hoary form. (B. M. 3307.)

W. rosmariniformis (Rosemary-like).* Victorian Rosemary. *fl.* pale blue, almost sessile, all axillary; corolla pubescent outside. July. *l.* in whorls of four, oblong-lanceolate to linear, acute or obtuse, ½in. to 1in. long, coriaceous, glabrous and shining above, hoary or silvery-white beneath, the margins recurved or revolute. *h.* several feet. 1791. (A. B. R. 214, under name of *W. rosmarinacea.*)

WEST WIND, FLOWER OF THE. *See* **Zephyranthes.**

WEYMOUTH PINE. *See* **Pinus Strobus.**

WHANGEE OR WANGHEE CANE. *See* **Phyllostachys nigra.**

WHEAT. *See* **Triticum vulgare.**

WHEAT, BUCK. *See* **Fagopyrum esculentum.**

WHEAT, GUINEA OR TURKEY. *See* **Zea Mays.**

WHEELBARROWS. Wheelbarrows are amongst the most essential of garden requisites, and are invariably in daily use. The common Box-barrow with broad wheel is that in general use, and is best adapted for wheeling soil, rubbish, manure, &c. If wheeling on planks becomes necessary, as is sometimes the case when excavations or new walks are made, the Navvy-barrow is best, as the wheel, being made of iron, does not collect soil to clog it, and the sides are set on an angle outwards to facilitate emptying readily. Flat Barrows of the shape

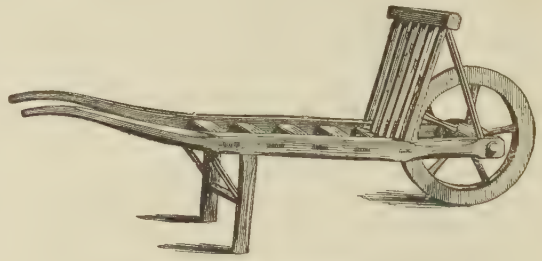

FIG. 218. FLAT MARKET-GARDEN BARROW.

represented in Fig. 218 are largely employed in market gardens for wheeling baskets of fruit, vegetables, &c., to the sheds. One, at least, of these Barrows is always useful in a garden, for the removal of boxes, hampers, or anything that cannot be readily fitted into an ordinary Wheelbarrow. It may also be employed for wheeling a water-barrel, if the use of one is necessary.

WHIN. *See* **Ulex.**

WHINBERRY. A common name for **Vaccinium Myrtillus** (which *see*).

WHIN, PETTY. *See* **Genista anglica.**

WHIP-GRAFTING. *See* **Grafting.**

WHITE ALDER. *See* **Platylophus trifoliata.**

WHITE ANTS, or TERMITES. Fortunately, these are not British insects; but in warm countries, and especially throughout the tropics, they abound, and do great destruction to woodwork of every kind. Only a very few kinds of wood can resist their jaws. At La Rochelle and Bordeaux, on the West coast of France, they have been introduced, and have become so abundant as to force themselves into notice by the mischief they do to the woodwork of the public offices and of dwelling-houses, and also to the public records. The Termites resemble true Ants in living in very large communities, comprising males, females, and neuters. Among the neuters may often be distinguished workers and soldiers, the latter attending only to the defence of the community, while the former do the hard work. In structure the Termites differ greatly from the true Ants, as they belong to the *Neuroptera*, while the true Ants are *Hymenoptera* (*see* **Insects**). Among Termites only the mature males and females are winged. The wings are about twice as long as the body; all four are of nearly equal size, and are provided with a stout front border, or nerve, and a number of slender, indistinct nerves in the other parts of the wings. When not in use they lie flat on the back. The segments of the thorax are distinct; the abdomen is flattened; the head is rather flattened, and has cutting jaws; and the legs are rather short and slender. The neuters have no wings, or have only their rudiments. Some entomologists have regarded them as larvæ and pupæ of the males and females; others believe that they never become sexually mature. The species of Termites are very numerous; those that occur in Europe are named *Termes lucifugus* and *T. ruficollis.* The nests of certain tropical species

White Ants, or Termites—*continued.*

are built of mud on the soil, reach a height of from 10ft. to 15ft., and are so hard as to require a pickaxe to penetrate the outer walls. Other species form nests of clay high up among the branches of trees. They always work under cover of galleries of mud, or in wood, as they hate daylight. When the males and females become winged, they leave the nest, and pair, and soon afterwards the females drop their wings, and are taken back into the nest by the workers. Here each female is inclosed in a clay cell built around her by the workers. Her abdomen grows enormously, becoming filled with eggs, of which a single female can lay as many as 80,000 in twenty-four hours. The eggs are carried away by the workers, and are carefully tended, as among bees and wasps. The number of Termites in a large nest is enormous.

As they are not likely to prove hurtful in England, there is no need to dwell upon any remedies.

WHITE ARUM LILY. *See* **Richardia africana.**

WHITE ASH. *See* **Fraxinus americana.**

WHITE BASSWOOD, AMERICAN. *See* **Tilia heterophylla.**

WHITE BEAM-TREE. *See* **Pyrus Aria.**

WHITE BLADDER FLOWER. *See* **Physianthus albens.**

WHITE BOTHEN, WHITE GOLDES. Old names for *Chrysanthemum Leucanthemum.*

WHITE BOTTLE. A common name for **Silene inflata** (which *see*).

WHITE BUTTERWOOD. *See* **Trichilia spondioides.**

WHITE CEDAR. A common name for *Chamæcyparis. See also* **Thuya gigantea** and **T. occidentalis.**

WHITE CYPRESS. *See* **Taxodium distichum.**

WHITE ELM. *See* **Ulmus americana.**

WHITE ERMINE MOTH. *See* **Spilosoma menthastri.**

WHITEHEADIA (named after its discoverer, the Rev. Henry Whitehead, "to whom I am indebted for many curious plants" [Harvey]). ORD. *Liliaceæ.* A monotypic genus. The species is a greenhouse, bulbous plant. It thrives in any rich soil, and may be propagated by offsets.

W. bifolia (two-leaved). *fl.*, perianth light green, subsessile, solitary, four to five lines long, the segments subequal, slightly spreading above the base; stamens six, slightly exserted; raceme dense, 3in. to 6in. long; scape clavate, 1½ft. long; bracts amplexicaul, 1in. to 1¼in. long. April. *l.* two, opposite, roundish-oblong, glabrous, fleshy-membranous, 6in. to 8in. long, 4in. to 6in. broad, sub-acute or emarginate. Bulb fuscous, 1½in. to 2in. thick. South Africa, 1792. SYNS. *Eucomis bifolia* (B. M. 480), *Melanthium massoniæfolium* (A. B. R. 368).

WHITE-HEART HICKORY. *See* **Carya tomentosa.**

WHITE HELLEBORE. *See* **Veratrum.**

WHITE LIME. *See* **Tilia argentea.**

WHITE PINE. *See* **Pinus flexilis.**

WHITE POTHERB. *See* **Valerianella olitoria.**

WHITE ROOT. An old name for Solomon's Seal (*Polygonatum multiflorum*).

WHITE SAPOTA. A common name for **Casimiroa edulis** (which *see*).

WHITETHORN. A popular name for **Cratægus Oxyacantha** (which *see*).

WHITE-TREE. A common name for **Melaleuca leucadendron** (which *see*).

WHITE WOOD. A name applied to *Liriodendron tulipifera, Tilia americana,* &c.

WHITFIELDIA (named after T. Whitfield, a botanical collector of African plants). ORD. *Acanthaceæ.* A small genus (two species) of ornamental, stove shrubs, natives of tropical Africa. Flowers white or brick-red, shortly pedicellate, solitary in the axils of opposite bracts, disposed in a terminal raceme; calyx five-parted; corolla with five twisted lobes; stamens four, didynamous; bracteoles under the calyx, and sometimes the bracts, coloured. Leaves opposite, entire. Only one of the species has been introduced. For culture, *see* **Barleria.**

W. lateritia (brick-red).* *fl.*, calyx brick-red, ample; corolla orange-red or brick-red, twice as long as the calyx, between campanulate and funnel-shaped; pedicels opposite, drooping. October to March. *l.* opposite, ovate or oblong-ovate, subcoriaceous, evergreen, waved, penniveined. Branches spreading, terete, rather tortuous. *h.* 3ft. 1841. (B. M. 4155; F. d. S. 32.

WHITLAVIA. This is regarded, by the authors of the "Genera Plantarum," as synonymous with **Phacelia** (which *see*). The proper name of *Whitlavia grandiflora* (see Fig. 219) is now *Phacelia Whitlavia.*

FIG. 219. FLOWERING BRANCHES OF WHITLAVIA GRANDIFLORA (PHACELIA WHITLAVIA).

WHITLEYA. Included under **Scopolia** (which *see*).

WHITLOW GRASS. *See* **Draba** and **Paronychia.**

WHITTEN-TREE. A common name for **Viburnum Opulus** (which *see*).

WHITWORT. An old name for Feverfew (*Pyrethrum Parthenium*).

WHORL. A ring of organs all on the same plane.

WHORL FLOWER. A common name for **Morina longifolia** (which *see*).

WHORTLEBERRY. *See* **Vaccinium Myrtillus.** The name is also applied to other species.

WIBORGIA. A synonym of **Viborgia** (which *see*).

WIDDRINGTONIA (named in honour of Captain Widdrington [formerly Cook], who travelled in Spain). African Cypress. ORD. *Coniferæ*. A small genus (three species) of greenhouse shrubs or trees, included, by Bentham and Hooker, under *Callitris;* two are natives of South Africa, and the third is found in Madagascar. Flowers dicœcious, or male and female on separate plants; male catkins oblong or cylindrical, the females globular, without footstalks. Leaves thickly set, alternately or in whorls, linear or needle-shaped, spreading, but sometimes very small, scale-like, approaching imbricate, with a gland on the back. Cones thick, woody, nearly equally four-valved, globular, two or three together. Two species have been introduced. For culture, *see* **Callitris.**

W. cupressoides (Cypress-like). *l.* on the branches acute, somewhat spreading at the points; those on the branchlets four-rowed, much shorter, imbricated. *cones* ovate, obtuse, nine to ten lines long. Branches elongated, erect, pyramidal; branchlets slender, bent downwards, or pendent at the ends, covered with leaves. *h.* 4ft. to 10ft. South Africa, 1799. Shrub.

W. juniperoides (Juniper-like). Cape Gum-tree. *fl.*, male catkins oblong-cylindrical, terminal. *l.* adherent at base, decurrent, leathery, glaucous-green; young ones mostly linear or needle-shaped, sharp-pointed, spreading, slightly curved, opposite or in whorls of three, ¾in. to 1in. long; adults scattered; those on the branchlets sometimes ovate-lanceolate or rhomboid, obtuse or sharp-pointed. *cones* three or four together, much smaller than in *W. cupressoides*, rounded, slightly depressed. Stem straight; branches erect or spreading. South Africa, 1756. Tree.

FIG. 220. PORTION OF INFLORESCENCE OF WIGANDIA MACROPHYLLA.

WIDOW, MOURNFUL. *See* **Scabiosa atropurpurea.**

WIDOW-WAIL. *See* **Cneorum.**

WIDOW-WISSE. An old name for *Genista tinctoria.*

WIGANDIA (named in honour of John Wigand, 1523-1587, a Bishop of Pomerania). ORD. *Hydrophyllaceæ*. A small genus (three or four closely-related species) of tall, hispid, stove or greenhouse herbs, broadly dispersed over the mountainous regions of tropical America. Flowers sessile at the sides of scorpioid branches, in terminal, amply dichotomous cymes; calyx segments linear; corolla tube short, broadly campanulate, not scaly, the limb ample, spreading, of five imbricated lobes; stamens five, nearly equally affixed, often exserted; filaments hispid with reflexed pili below the middle. Leaves alternate, ample, wrinkled, generally doubly-toothed. The species are frequently, on account of their fine foliage and bold habit, used for sub-tropical bedding. Seeds should be sown in early spring, in heat; and the seedlings grown on in light, loamy soil, hardened off, and planted out in the open in June. The plants may also be propagated by means of cuttings, inserted in sandy soil, in bottom heat, and carefully shaded until rooted.

FIG. 221. WIGANDIA URENS.

Wigandia—*continued.*

W. caracasana (Caraccas). A synonym of *W. macrophylla.*

W. macrophylla (large-leaved).* *fl.* lilac; sepals acute, hoary-tomentose, shorter than the corolla; spikes revolute at apex, secund, the rachis villous-pubescent. April. *l.* elliptic-cordate, slightly acute, hairy-tomentose, ferruginous above. *h.* 10ft. Caracas, 1836. See Fig. 220. SYN. *W. caracasana* (B. M. 4575; B. R. 1966; F. d. S. 755; L. J. F. 132).

W. urens (stinging). *fl.* disposed in scorpioid panicles; calyx woolly, with linear, acute sepals; corolla violet-blue, the margins of the lobes somewhat revolute. Autumn. *h.* 6ft. Mexico (?), 1830. This species differs from *W. macrophylla* in its looser habit, and in its longer-stalked, more spreading leaves of a deeper ashy-green, shaded with red on the petioles. See Fig. 221.

FIG. 222. WIGANDIA VIGIERI.

W. Vigieri (Vigier's).* *fl.*, calyx green, exceeding the corolla tube, with five linear, acute sepals; corolla lilac-blue, passing through vinous-red to fawn-colour before fading, rotate-infundibular, woolly outside, glabrous; inflorescence very large, paniculate, divaricate. Autumn. *l.* alternate, oval-elliptic, cordate at the base, irregularly and sparsely toothed, channelled; petioles 9in. long. *h.* 6ft. Mexico (?), 1868. See Fig. 222.

WIG-TREE. A common name for **Rhus Cotinus** (which *see*).

WIKSTRÖMIA. A synonym of **Laplacea** (which *see*).

WILD APPLE, or **WILDING.** *See* **Pyrus Malus.**

WILD BERGAMOT. *See* **Monarda fistulosa.**

WILD CLARY. *See* **Salvia Verbenaca.**

WILD CLOVE *See* **Pimenta acris.**

WILD DATE. *See* **Phœnix sylvestris.**

WILD HYACINTH. *See* **Scilla nutans.**

WILD IRISHMAN. *See* **Discaria Toumatou.**

WILD OLIVE. *See* **Elæagnus** and **Olea europæa.**

WILD SNOWBALL. *See* **Ceanothus americanus.**

WILD WATER LEMON. *See* **Passiflora fœtida.**

WILD WILLIAM. An old name for *Lychnis Flos-cuculi.*

WILLDENOVIA (of Gmelin). A synonym of **Rondeletia** (which *see*).

WILLDENOWIA (named in honour of Charles Louis Willdenow, 1765-1812, Professor of Botany at Berlin). SYN. *Nematanthus* (of Nees). ORD. *Restiaceæ.* A genus comprising eight species of greenhouse herbs, with Rush-like, leafless stems, natives of South Africa. Flowers diœcious; male spikelets loosely many-flowered, interruptedly spicate; females one-flowered, sessile. Sheaths loose, persistent. It is doubtful whether the under-mentioned species is still in cultivation. It thrives in a compost of loam and peat, and may be increased by divisions.

W. teres (terete). *fl.*, male inflorescence 2in. to 2½in. long, erect, spicately or paniculately cymose; female spikelets one to three at the apex of the culm. Sheaths 1½in. in length, convolute, fuscous, glabrous, acuminate at apex. Culms erect, 3ft. or more high, terete, virgate-branched near the middle; branches ascending, white-lepidoted and spotted with purple. 1790. The plant sometimes grown under this name is a species of *Restio.*

WILLEMETIA (named in honour of P. R. Willemet, 1762-1790, author of "Herbarium Mauritianum"). SYNS. *Noltia, Vittmannia.* ORD. *Rhamneæ.* A monotypic genus. The species is a pretty, perfectly glabrous, greenhouse shrub. It thrives in a compost of sandy loam and peat. Increased by cuttings, inserted in sand, under a glass.

W. africana (African). *fl.* white, in cymes and panicles about 1in. long; petals five, cucullate, sessile. May. *l.* alternate, oblong-lanceolate, more or less obtuse, serrated, feather-nerved, 2in. to 2½in. long, paler beneath. *h.* 10ft. to 12ft. South Africa. The proper name of this plant is now *Noltia africana.*

WILLESDEN PAPER AND CANVAS. For making temporary shelters where light is not necessary, the Paper and Canvas manufactured by the Willesden Paper Company possess all the requisite properties; being fairly cheap, they may be freely used for light coverings of any kind. The Paper is quite waterproof, light, and of fair tensile strength, as anyone who saw the pavilion erected in the grounds of the Crystal Palace, during the exhibition of 1884, will have noticed; except that visitors had cut the Paper about, the edifice was as sound nine months after erection as when first put up. A tank was also exhibited, which held about half a ton of water, the Paper not being saturated for quite two months; and no doubt it would have been sound for the whole time the exhibition lasted, but that some mischievous person stuck a knife through the side, to see if it was really Paper. These examples will show that the Paper will answer what is required of it, and therefore all that is left is to describe the manner of using it for garden purposes.

The stout brown Paper is the best for general use. It is made about 4½ft. wide, a useful size for temporary

Willesden Paper and Canvas—*continued.*

roofs, and for screens to put over frames or plants. So far as roofs are concerned, the makers give full directions, and therefore this part of the subject need not be considered here. The most useful appliances in any garden, for providing temporary shelter, are a number of frames about 6ft. long and the width of the paper. The woodwork should be about 1½in. in thickness, and should be braced across to keep the whole structure rigid. Over these frames the Paper should be nailed, preferably on both sides; thoroughly waterproof coverings, which will keep off a fair amount of frost, are thus made for protecting tender subjects in frames or beds, while for outdoor Mushroom-beds they are most convenient. Being flat and comparatively thin, a large number can be stowed away in a little space, when not required for active use. For wall trees of doubtful hardiness, the prepared Canvas, if put on frames, makes a good protective medium when the shelters are made as above, and, having more tensile strength than the Paper, will not be torn with any ordinary usage.

Besides being made into flat screens, wooden frames of different patterns, such as spans, and similar forms, can be constructed in light wooden framing, and covered with Willesden Paper, affording very decent protection against frost and snow to plants of doubtful hardiness in the borders. Larger frames can also be made for the protection of shrubs, &c. In all cases the Paper can be adapted to almost any form required, and a little ingenuity on the part of the user will lead to the construction of many most useful contrivances.

The lighter samples can also be used for packing plants; being waterproof, they prevent undue evaporation. For lining baskets containing cut flowers or plants, the Paper should be found very useful, as it can be made to fit the shape of the basket or hamper, and will last for a long time. Many things, such as hard-wooded cuttings, rosebuds, and similar stock, can be rolled in the Paper, the ends being folded over, and they will travel as well as in lead foil or rubber tissue, and at less cost. Waterproof labels, for writing on which no special ink is required, are also made of Willesden Paper; these are durable, and, being made in various sizes, are useful for many purposes. In fact, there is practically no end to the purposes to which this Paper can be applied in and about the garden.

WILLOW. *See* **Salix.**

WILLOW, AMERICAN WATER. A common name for **Dianthera americana** (which *see*).

WILLOW, FRENCH OR PERSIAN. *See* **Epilobium angustifolium.**

WILLOW GRASS. *See* **Polygonum amphibium.**

WILLOW HERB. *See* **Epilobium.**

WILLOW HORNET CLEARWING MOTH. *See* **Sesia.**

WILLOW, KILMARNOCK WEEPING. *See* **Salix Caprea pendula.**

WILLOW SAWFLIES. Few, if any, plants are more liable than Willows to be injured by Sawflies. By far the larger number of the species that feed on Willows and Sallows belong to the genus *Nematus*, but a few belong to two or three other genera. It would be useless to attempt to describe, or even to enumerate, the many kinds that have been found on the different species of *Salix*; suffice it to say that Cameron, in his "Monograph of British Phytophagous Hymenoptera," enumerates as British thirty-three species of *Nematus*, and twenty species under other genera, found on *Salix*; and that yet others have been recorded from the Continent of Europe as found on Willows.

Willow Sawflies—*continued.*

We cannot, therefore, do more than indicate briefly the chief modes in which these insects may prove hurtful.

The larvæ of many species feed, exposed to view, on the edges or the lower surface of the leaves, often keeping the hinder part of their bodies coiled in a spiral. Others live between folded or rolled leaves; and a few live in mines in the leaf-blades. Many species are Gall-makers; and of these the habits and the galls vary greatly. Several species, chiefly of *Euura*, produce swellings of the branches, mostly in those of the *cinerea* section of *Salix*. Each swelling is occupied by one larva. Others, mostly species of *Nematus*, produce galls of two or three forms on the leaves. One common kind of gall resembles peas in form and size, and is usually adherent to the lower surface; though on some Willows (*e.g.*, *S. purpurea*) the galls are more often fixed to the upper surface. The Pea Galls vary in surface-appendages according to the species of Willow, being smooth on some, downy on others. They are formed by *Nematus pedunculi*, and by several other species of this genus of Sawflies. Another very common form of gall on Willow leaves—often distinguished as "Bean Galls," from their shape—sometimes resembles small haricot beans in pairs, side by side, in the tissue of the leaf, projecting about equally from both of its surfaces. They are usually about ⅛in. long by ¼in. broad. They are green or red on the upper surface, pale green below, and may be smooth or downy, according to the kind of Willow on which they are formed. One of the commonest Gall-makers of this group is *Nematus gallicola*, which makes the galls so often seen on the leaves of *Salix alba*, *S. Caprea*, *S. fragilis*, and other Willows; other species form somewhat similar galls on several of the smaller Willows, *e.g.*, *Salix Lapponum*, *S. nigricans*, *S. phylicifolia*, &c.; but it is impossible, in the brief space at disposal, to enter into a fuller discussion of these galls and their makers.

Remedies are scarcely called for unless the larvæ of Willow Sawflies are very plentiful. If so numerous as to endanger the health of the plants, those larvæ that feed exposed on the leaves may be dislodged by jarring or shaking the branches. They may be shaken into a vessel, and destroyed by having boiling water poured over them; or a ring of tar and cart-grease painted round the base of each tree will prevent them from crawling up again. The only reliable remedy against larvæ in rolled or mined leaves, or in galls, is hand-picking; but the damage is seldom so great as to call for so tedious and costly a remedy. As by far the greater number of the species burrow into the soil to become pupæ, any means to prevent their doing so tends to lessen the numbers of the insects. Rolling the ground below the trees, so as to render it compact, and applications of gas-lime, soot, or other substances poisonous or disagreeable to the insects, will prove useful in this way.

WILLUGBÆYA. A synonym of **Mikania** (which *see*).

WILLUGHBEIA (named after Francis Willughby, 1635-1672, an English naturalist, pupil of Ray). SYN. *Ancylocladus*. ORD. *Apocynaceæ*. A genus comprising eight or ten Malayan and East Asiatic species of stove, sarmentose or tall-climbing shrubs, all supposed to yield caoutchouc. Flowers in axillary cymes; calyx short, five-lobed; corolla salver-shaped, the tube nearly glabrous within, the mouth naked or with fleshy glands alternating with the lobes; stamens included in the tube. Berry large, globose or ovoid, many-seeded. Leaves opposite, on short petioles. For culture of *W. edulis*, the only species introduced, *see* **Allamanda.**

W. edulis (edible). *fl.* of a pale pink colour; cymes on short, stout peduncles. July. *fr.* edible, sub-ovoid, the size of a lemon. *l.* 4in. to 7in. long, oblong or obovate-oblong, obtusely acuminate or caudate, acute at base, thinly coriaceous; petioles ½in. to ¾in. long. India, 1818. An immense climber.

WILLUGHBEIA (of Klotzsch). A synonym of **Landolphia** (which *see*).

WIND. The various points from which the Wind proceeds, and the amount of its force, are matters requiring daily consideration in the proper management of glass structures, and for the preservation against injury of plants and trees outside. The damage caused by a rough gale is often of a most disastrous nature; sometimes large and valuable trees are uprooted, or have their branches torn off, causing permanent disfigurement. In different localities and situations, what are known as the prevailing Winds have to be taken into account in planting operations: in some, the gales most frequently proceed from one particular point—south-west, for instance—while in others, a wood, hill, or large belt of trees may afford protection from that, but not from some other direction. Situations on various parts of the sea-coast, and also inland, will be locally affected in regard to prevailing Winds. The destruction caused by the Wind to fruit crops is, unfortunately, too familiar. Newly-planted trees of all kinds, of sufficient size to be rocked to and fro by the force of the Wind, should always be secured with stakes for the first season, after which their roots will have generally taken a good hold, thus rendering them safe. Plants in pots—Chrysanthemums, for example—are soon destroyed by a gale if not securely staked and tied. A cold Wind has a most injurious effect on the tender foliage of trees and plants in glass structures, particularly in early spring, when too frequently it proceeds from an easterly or north-easterly direction. Preventive measures should be adopted, as far as possible, beforehand, so that when the Wind's force is suddenly increased to a gale, everything may be secured against injury. Not unfrequently, the proper provision which it is necessary to make against rough weather is forgotten when trees are newly planted; or plants in pots are placed in exposed situations during a calm period; and the effects of the first rough Wind are disastrous.

WINDFALL. A term frequently applied to such fruits as may often be found lying in an immature condition below the trees, *e.g.*, Apples, &c. The young fruits may be knocked off by one branch striking on another in a high wind; but very frequently the cause of the premature fall will be found, on careful examination, to be the presence of some parasite in the fruit. The most frequent cause is a larva feeding on the seeds, *e.g.*, the Apple or Codlin Grub (*Carpocapsa pomonana*) in immature Apples. Such larvæ generally leave the fruit very soon after its fall, to burrow in the soil, and there to become pupæ. It is, therefore, very desirable to prevent future harm by having the Windfalls picked up without delay, and given to pigs, or placed where the larvæ may be unable to find a favourable situation for becoming pupæ.

WIND FLOWER. *See* **Anemone** and **Gentiana Pneumonanthe.**

WINDOW GARDEN. Many cottagers and amateurs who have no glass structure at their command take an especial interest in plant cultivation, and set admirable examples of what may be accomplished by constant attention, even in an ordinary window. Window Gardening has of late years made rapid strides, partly from the encouragement given to it locally by the managers of annual exhibitions, and even more so by the greater interest in the cultivation of flowers which has become so generally diffused. By the term Window Gardening, the cultivation of plants in a window, or on the sill outside in favourable weather, should only be referred to; decorative subjects that are grown to perfection elsewhere, and then used temporarily for windows, ought not to be judged in comparison. Windows facing south, or nearly so, are best adapted for plants generally; but many subjects will succeed admirably in less favourable aspects. The general potting of window plants is best attended to in spring, when the drainage must be rendered complete. As a rule, it is necessary to use saucers to prevent water running into the room; the water should be emptied out so soon as the plant is well soaked. When water is required—and this time can only be known by practice—a good soaking should be given, and in summer an occasional sprinkling over the foliage, through a fine rose or syringe, generally helps to keep the plants clean and in health. During severe frost, window plants are at times unsafe in their usual quarters; they should then be placed temporarily on the floor for the night; in the day-time, where there is a fire in the room, plants are usually safe in the window, unless they are of an exceptionally tender kind. Amongst window plants that generally succeed well, Zonal Pelargoniums, of various sorts, perhaps take first place; the scented-leaved ones are also great favourites. Other subjects which may readily be adapted to culture in the same position are: Fuchsias, Calceolarias, some of the dwarf Campanulas, Chinese Primulas, several kinds of Cacti, greenhouse Ferns, spring-flowering bulbs (such as Hyacinths and Tulips), Heliotropes, Myrtles, &c. Many more might be enumerated, but those mentioned afford a great selection. *Richardia africana* and *Vallota purpurea* sometimes succeed as window plants.

Window Garden—*continued.*

WINDROOT. *See* **Asclepias tuberosa.**

WIND ROSE. *See* **Rœmeria hybrida.**

WINEBERRY. An old name for the Whortleberry (*Vaccinium Myrtillus*).

WINE PALM, EAST INDIAN. *See* **Phœnix sylvestris.**

WINGS. The two lateral petals of a papilionaceous corolla; any kind of membranous expansion.

WINTERA. A synonym of **Drimys** (which *see*).

WINTER ACONITE. *See* **Eranthis.**

WINTERANA. A synonym of **Canella** (which *see*).

WINTERBERRY. A common name for several species of **Ilex** (which *see*).

WINTER BLOOM. A common name for **Hamamelis virginica** (which *see*).

WINTER CHERRY. *See* **Physalis Alkekengi.**

WINTER CLOVER. A common name for **Mitchella repens** (which *see*).

WINTER CRESS. *See* **Barbarea.**

WINTER DAFFODIL. *See* **Sternbergia lutea.**

WINTER GARDEN. A term usually employed to denote a very large, cool, glass structure, from which the frost is merely excluded, the interior being occupied by subjects insufficiently hardy to withstand our climate outside during the winter. A Winter Garden is generally of sufficient size to allow of the centre part of the interior being laid out in walks and large beds. The latter are planted with all the stronger-growing occupants that cannot be properly accommodated in pots. Amongst them Himalayan Rhododendrons may be specially mentioned, as their foliage is attractive at all seasons, and their flowers in spring and summer are amongst the most beautiful; Camellias, Australian Acacias, and other hard-wooded plants of a like description, Araucarias, many Tree Ferns, Palms, and any good plants that only require a little protection in winter. A Winter Garden, if treated as a conservatory, would admit of the introduction of all greenhouse plants in their seasons on the shelves

Winter Garden—*continued.*

around, while the central beds might be planted with some of the subjects mentioned above, according to the available height and space. Tea Roses may be trained to pillars, also on the roof, if convenient, and numerous beautiful conservatory climbers succeed well when similarly situated and kept tied.

WINTERGREEN. *See* **Pyrola.**

WINTERGREEN, AROMATIC OR CREEPING. *See* **Gaultheria procumbens.**

WINTERGREEN, CHICKWEED. *See* **Trientalis.**

WINTER MOTHS. A name given, because of the time of their appearance, to certain moths belonging to the group *Geometrina* (*see* **Moths**), which is characterised by the possession of a slender body, and wings large relatively to their size of body. Of the Winter Moths, however, the females are wingless, or, rather, possess mere vestiges of wings, utterly useless as organs of flight; the males are well provided with wings of considerable size. Most of the species are included in the genus **Hybernia** (which *see*); but the insect to which the name is peculiarly applied, and which is most widely destructive, is *Cheimatobia brumata*. In this species the spread of wings of the male may reach about 1¼in.; but it is usually under this size. Both sexes are greyish-brown, with several indistinct, darker, wavy lines or bands across the wings. The female is heavier in the body, and has extremely small front wings. The moths appear between the beginning of October and the end of December. The females must crawl up the trees to reach a suitable situation for laying eggs; or they may, at times, be carried from one place to another by the males. The eggs are usually laid in the crevices of the bark, and in other places fitted to give them protection. The larvæ are bluish-green, with a narrow, dark stripe down the middle of the back, and three narrow, white stripes on each side. In some the ground-colour is smoky or dark brown. They live upon almost all kinds of trees and shrubs. At first, they eat into the buds in early spring; and, when the leaves begin to enlarge, the larvæ spin two or more leaves together, and feed, protected between them, in safety. When full-fed, they lower themselves to the ground, burrow into it, and form earthen cocoons, in which they become pupæ about the end of May or the beginning of June.

Remedies. The larvæ of *C. brumata* are so destructive that it is often most desirable to prevent or to check their ravages. Nothing can be done while the larvæ are in the buds; but, when nearly full-fed, and living between the leaves, they can be dislodged by beating and shaking the branches. The shock causes them to lower themselves by silken threads, or to fall to the ground. They can thus be collected in cloths spread below the plants, or crushed under foot. It is well to put a belt of some sticky substance on the base of the tree-trunks, to prevent the re-ascent of larvæ. Digging the soil around the roots helps also to lessen the number of pupæ, by exposing them to the quick eyes of birds, or to predacious insects. The most effectual remedies are those employed for the destruction of the females, and for the prevention of their ascent of the tree-trunks. This is effected readily, because of the useless nature of their wings, which compels them to creep up the trunk, unless at times carried on to the trees attached to the males. Whatever substance is used, it must remain soft and sticky for a day or two, must not injure the trunks, and must be renewed sufficiently often to keep the surface of the ring of bark sticky, say about each second day. Among the best of the compounds for catching female moths is the substance known as Davidson's Composition, or a mixture of tar and grease in equal proportions.

WINTERSWEET. *See* **Toxicophlæa spectabilis.**

WINTER WOLF'S-BANE. A common name for **Eranthis hyemalis** (which *see*).

WIRE. Wire is extremely useful to florists and gardeners, who could not well do without it in making up bouquets and other personal decorations. Various thicknesses are used, according to the special purpose for which it is required: for instance, when flowers have to be provided with artificial stalks, short lengths of stiff Wire, known as "stubbs," are used. These are generally procured in bundles, cut into 6in. or 8in. lengths, which are found most convenient. Binding Wire is very fine, and is largely employed in bouquet-making for securing the short lengths, already referred to, to the flowers, and for tying all the stalks together. It is wound on reels, and is strong, although quite pliable.

The springs sometimes used for fixing certain kinds of flowers in bouquets, so that they shall move about, may be readily made by binding tightly the piece of small Wire which it is intended should form the spring round a piece of a rather larger size, and then slipping off the coil.

Wire is largely employed for both movable and permanent trellises in glass houses, &c.; for this purpose, it is best galvanised, to prevent rusting. Copper binding Wire, in quantities according to requirements, should be kept in stock; it is often useful, and there are small and large gauges of this made, as well as of iron, the other principal metal used in Wire-making. Wire netting, and its various uses, such as preserving vegetable crops from destruction by rabbits, &c., are familiar to everyone. The "mesh" refers to the size of the spaces; thus Wire netting of 1in. mesh has the spaces that distance across, and so on with other finer or coarser sorts.

WIREWORMS. The popular name of certain pale yellowish-brown, slender larvæ, possessed of skins so tough and hard that they look and feel not unlike short pieces of moderately thick wire, flattened from above downwards. The body is of uniform thickness, and is marked with rings showing the divisions between the

FIG. 223. WIREWORM.

segments of which it consists (see Fig. 223). The head is small, flattened, and darker than the body. The three front body-rings bear each a pair of short, brown, true legs, and there is a solitary prehensile foot on the lower surface of the conical hindmost segment of the body. Wireworms feed near the surface of the soil, but concealed in it; and they gnaw the stems and roots of plants just below its surface. The plants are thereby killed, or, at least, very much injured; and the crops in gardens, as well as in the fields, are, occasionally, seriously damaged from this cause. When the Wireworms reach their full size, they burrow into the soil to a considerable depth, and each forms for itself an earthen cocoon. In this it becomes a pupa, usually about the end of summer. Many of the Beetles emerge after spending little more than a fortnight in the pupa state, but some, probably, do not emerge till the next spring or summer. Wireworms vary in size to some extent, as they are the larvæ of many kinds of Beetles, all belonging to the family *Elateridæ*, but they seldom reach 1in. in length. They feed on almost all kinds of herbaceous plants, but it has been observed that they avoid Mustard: hence it has been suggested that this plant should be sown in ground that is much infested by them, in order to starve them out.

The Beetles are well known under one or other of

Wireworms—*continued.*

the names Click Beetle, Snap Beetle, Spring Beetle, or Skipjack. All four names allude to the method by which the insects, when laid on their backs, right themselves, and which is described below. There are many species of Click Beetles distributed amongst numerous genera, which differ among themselves in minor peculiarities; but all of them have so strong a family likeness that they are easily recognised as members of the family *Elateridæ*. Their form is elongated, with nearly parallel sides, but the body is rather pointed behind; the surface is hard. The head is deeply sunk in the thorax; the latter is prolonged backwards at the hinder angles into two sharp points, which prevent lateral movements of the abdomen; it has a sharp, prominent spine on its front part below, and this spine fits into a groove in front of the base of the middle legs. The antennæ, which are often serrated, can be laid, for protection, into grooves on the lower surface of the head — one on each side. The legs are short, but the wings are large and powerful. The Beetles are usually black, often with the basal two-thirds of the elytra some shade between rusty-red and blood-red, less often with short, fuscous or yellowish hairs spread uniformly over the surface, or restricted to defined spots or patches. They seldom exceed ⅝in. or fall below ¼in. in length. The number of British species of this family is large, and the Beetles are abundant everywhere during autumn; but only a few of the species are large enough to be familiarly known by anyone except an entomologist. They may be often seen crawling on walls and among herbage. When approached, they allow themselves to drop for concealment; and their form renders them very liable to fall on their back. Their legs are too short to be of service in turning themselves over; but the spine on the breast is an efficient organ for this purpose. When one of the insects wishes to replace itself on its legs, it bends the body backwards till it rests only on the head and the tip of the abdomen. In this position the spine is dragged out of its groove, but, on the Beetle bringing the head up smartly, the spine springs back into its groove, and the back of the Beetle is struck so hard against the surface on which it lies, that the insect is thrown some inches into the air, like a skipjack, and usually falls on its legs. The names Skipjack and Spring Beetle refer to this power of leaping; Click Beetle and Snap Beetle refer to the sound produced in the leap. It is probable that the larvæ of almost all of the *Elateridæ* are Wireworms in appearance and in habits; but only a few of the species are known to be very injurious to garden and field produce; and some, at least, feed on decaying vegetable tissues.

The following are the most hurtful species, according to the observations of those entomologists who have most carefully studied the subject: *Agriotes sputator*, *A. lineatus*, and *A. obscurus*. The first of these is little more than ¼in. long, and is black, and slightly glossy, but is pubescent; the front edge and hinder angles of the thorax, and the greater part of the elytra, are dull yellowish-brown or dusky; the legs and antennæ are paler; the elytra are deeply punctate-striate. The other two species are about ½in. or ⅝in. long, and are thought by some to be forms of a single species. *A. lineatus* is fuscous, with greyish pubescence; the thorax is nearly black; the elytra are punctate-striate, the striæ (in pairs) greyish, the interspaces brown, so that the elytra are striped lengthwise with dull grey and brown; the limbs are rusty-red. *A. obscurus* is dull brown-black, with dark pubescence, the elytra faintly punctate-striate, and nearly black; the thighs are nearly black, the rest of the legs and the antennæ dull rusty-red. Still another species is probably a serious foe to cultivated plants at times. This is *Athous hæmorrhoidalis;* the insect is from ½in. to ⅝in. long,

Wireworms—*continued.*

and is dusky-black, with the elytra brownish; the limbs are dull red, except the black thighs. In the perfect state these insects are harmless: the damage is done only in the larval condition. This stage has been observed to continue in *A. lineatus* during five years; hence, the larvæ have time to do much mischief. It would be useless to enumerate all the plants on which they have been observed to feed; but among the more important garden plants are Cabbages, Carrots, Dahlias, Irises, Lettuces, Onions, Pinks, Potatoes, Turnips, and other favourites. They also often seriously injure the grass in lawns. Where ground is allowed to lie unbroken for a time, they multiply, and from it they spread to the adjoining pieces of ground. When soil that has lain fallow, or has been a lawn for some years, is broken up, the crops grown in it are apt to suffer severely from attacks of Wireworm.

Remedies. When the larvæ are very numerous, the soil should be broken up, as this exposes the Wireworms to the eyes of birds. Deep-trenching has also been recommended as a useful measure. If practicable, one of the most successful methods is to starve out the larvæ by allowing the ground to lie fallow for a year, merely cutting down and destroying the weeds on it; or a crop of Mustard (*Brassica alba*) may be grown on it, as the larvæ avoid this plant. Frequent stirring of the soil is unfavourable to them; and so, to a slight extent, is the employment of a heavy roller. Various applications to the soil have been used with success. On ground allowed to lie fallow for a year, a good coating of fresh gas-lime is of great use; but where crops have to be grown without a break of this kind, soot and guano are better, scattered before or during heavy rain. One part of nitrate of soda to two of common salt has also worked well. In gardens, paraffin has been used in solution (one in fifteen) with success, for watering infested plants, or along drills of Carrots, &c. Where any plants are fading without apparent cause, the roots should be examined for Wireworms, and one of the remedies recommended above should be applied to the injured plants. Traps for Wireworms, formed of pieces of lettuce, carrot, or other favourite food, may also be used. These should be buried a little below the surface, and removed, examined every day, and the Wireworms on them collected and destroyed.

WISTARIA (named in honour of Caspar Wistar, 1761-1818, Professor of Anatomy in the University of Pennsylvania). Grape-flower Vine. SYNS. *Diplonyx* and *Thyrsanthus*. ORD. *Leguminosæ*. A small genus (four or five species) of hardy, tall, climbing, deciduous shrubs, natives of North America, China, and Japan. Flowers usually bluish, scattered at the sides of the rachis; two upper calyx teeth short and sub-connate, the lower ones usually longer; standard ample, with two parallel ridges at the base; wings oblong-falcate; racemes terminal; bracts very caducous. Pods elongated, torulose, two-valved. Leaves imparipinnate; leaflets entire, penni-veined and reticulate-venulose, often stipellate. Wistarias thrive in any good, loamy soil, and grow fast when once established. They are most readily propagated by layering the young growing shoots during the summer months, and detaching them from the parent plant the following year.

W. brachybotrys (short-clustered). *fl.* violet-purple; standard orbicular; pedicels one-flowered, shorter than the acuminate, caducous bracts; racemes short, erect or loosely spreading. April. *l.* imparipinnate, four to six-jugate; leaflets petiolulate, truncate or sub-cordate at base, ovate-lanceolate, acuminate, silky-canescent on both sides. Branches tortuous. *h.* 3ft. to 5ft. Japan. (F. d. S. 880; S. Z. F. J. 45.)

W. chinensis (Chinese).* Chinese Kidney-bean Tree. *fl.* large, inodorous, produced in great abundance on established plants; wings of the corolla each having one auricle. May and June (sometimes a second crop of flowers in August). *l.*, leaflets ovate, acuminate, in opposite, distant pairs, clothed on both sides with a thin, silky, adpressed pubescence. China, 1816. See Fig. 224.

Wistaria—*continued.*

SYNS. *W. sinensis*, *Glycine chinensis* B. M. 2083), *G. sinensis* (B. R. 650; L. B. C. 773).

W. c. flore-pleno (double-flowered). A handsome variety, with double flowers. 1882. (F. & P. 1882, 557.)

W. c. macrobotrys (large-clustered). *fl.* white, tinted with bluish-purple, borne in very long racemes. Japan, 1870.

W. c. variegata (variegated). A form with bright silvery-variegated foliage. 1886.

FIG. 224. PORTION OF FLOWERING BRANCH OF WISTARIA CHINENSIS.

W. frutescens (shrubby). American Kidney-bean Tree. *fl.* odorous; racemes 4in. to 6in. long, 2in. to 3in. in diameter, on short branches, dense-flowered; bracts large, caducous. April and May. *fr.*, pods one or several-seeded. *l.*, young ones (and branches) silky-pubescent; leaflets nine to thirteen, 1in. long, ovate-lanceolate or oblong; stipels none. North America, 1724. SYNS. *Glycine frutescens* (B. M. 2103) and *Thyrsanthus frutescens*.

W. japonica (Japanese).* *fl.* white, in simple, nodding racemes; standard obovate, obtuse, entire; pedicels one-flowered, horizontally spreading, terete; peduncles slender. July and August. *l.* imparipinnate, four to six-jugate; leaflets pedicellate, ovate or ovate-lanceolate, obtuse, acuminate, entire, petiolulate. Japan. A glabrous, twining shrub. (S. Z. F. J. 43.)

W. multijuga (many-paired). *fl.* lilac, with purple wings and keel, rather smaller than in *W. chinensis*, and growing in racemes which are said to be upwards of 2ft. in length. Summer. *l.* pinnate; leaflets numerous, elliptic-ovate, acuminate. Japan, 1874. (F. d. S. 2002.)

W. sinensis (Chinese). A synonym of *W. chinensis*.

WISTARIA, TUBEROUS-ROOTED. *See* **Apios tuberosa.**

WITCHES' THIMBLE. *See* **Silene maritima.**

WITCH HAZEL. *See* **Hamamelis.**

WITCH KNOTS. The name popularly bestowed on the curious clusters of twigs (looking very much like the nest of a rook, or some other large bird, when seen from a distance) that so frequently occur on the larger branches of Birch, Hornbeam, and certain other trees. The twigs are usually somewhat swollen, and both they and the sickly-looking leaves upon them are duller green than usual, and frequently show a slightly velvety surface. The causes of these deformities escaped detection till they were carefully investigated a few years ago with the microscope, and were found to differ in various trees.

Witch Knots—*continued.*

In Birch and Hornbeam, they are the work of minute Fungi, belonging to a very lowly group of *Ascomycetes*. The mycelium of the Fungi lives in the tissues of the host-plant's leaves and bark; and the velvety appearance mentioned above results from the outgrowth over the whole epidermis of the organs of reproduction. These latter consist of asci (*see* **Pyrenomycetes**) in each of which eight (or more) spores are formed, and from which they are scattered when mature. The asci in *Exoascus* (as the most important genus of Witch Knot Fungi is called) are quite exposed to casualties from without, instead of being inclosed in a perithecium, as in *Pyrenomycetes*. The number of asci and of spores is immense; but they are far too small individually to be detected, except when thin sections of the diseased parts are examined with a lens of high magnifying power. The following species of *Exoascus* give rise to Witch Knots: *E. turgidus*, on Birch; *E. Carpini*, on Hornbeam; and *E. Institiæ*, on Bullace. It may be noted that other species of the genus produce distortions of the leaves of various trees and shrubs (Poplars, Alder, Elm, Cherry, &c.), and that *E. Pruni* is the cause of the disease of the fruit in various species of *Prunus* known as "Bladder Plums."

In the Birch, a diseased condition, a good deal like a young Witch Knot, is often of frequent occurrence. It is the work of a species of *Phytoptus* or Gall-mite (*see* **Mites**), and results from the stimulation, by the myriads of minute Mites, of the growing tissues in the buds, which are increased in size, but never develop properly. The buds in the axils of the leaf-scales, instead of remaining undeveloped, enlarge to a conspicuous size, or grow into stunted branches; and on this process being repeated year after year, the mass of buds, &c., may reach the size of a cricket ball, but is usually smaller. There is no real difficulty in distinguishing these Mite Galls from true Witch Knots caused by Fungi. The Silver Fir (*Abies pectinata*) occasionally bears Witch Knots, which are made up of a central swelling of the stem, or of a large limb. From this arise one or more branches, on which grow very many small branches crowded densely together. The needles are short, thick, brittle, and bright green. All parts of the Witch Knots are traversed by mycelium; and the leaves bear over their surfaces numerous small, yellow, membranous cups, filled with minute, yellow spores for reproduction. These are the characteristic "fruits" of a Fungus named *Æcidium elatinum*. This Fungus renders the stems, &c., brittle, and liable to injury from wind; and it also causes the leaves to fall early.

Treatment. The only method likely to be of use is to cut off and burn Witch Knots of all kinds, to prevent the diseases from being propagated by the spores.

WITCH OR WYCH ELM. *See* **Ulmus montana.**

WITHERINGIA (name commemorative of William Withering, of Birmingham, 1741-1799, author of a "Botanical Arrangement of the Vegetables of Great Britain," 1776). SYNS. *Aureliana*, *Bassovia* (now the correct name). ORD. *Solanaceæ*. A genus comprising about a dozen species of stove or greenhouse, erect or

Witheringia—*continued.*

sarmentose shrubs or small trees, rarely tall herbs, natives of South and Central America and the West Indies. Flowers often rather small; calyx five to ten-toothed; corolla deeply five-cleft; pedicels often fascicled, umbellate, solitary or twin. Leaves entire or slightly sinuate. Most of the species formerly known in gardens as Witheringias have been removed to **Solanum** (which *see*), but it is doubtful if any are now cultivated.

WITHE ROD, AMERICAN. *See* **Viburnum nudum.**

WITHY. *See* **Salix fragilis.**

WITLOOF. A variety of Chicory (*Cichorium Intybus*).

WITSENIA (named after Nicholas Witsen, a Dutch patron of botany). ORD. *Irideæ*. A monotypic genus. The species is an ornamental, greenhouse shrub. It thrives in sandy peat, and may be increased by divisions, or by seeds.

W. corymbosa (corymbose).* *fl.* one (or two?) to a spathe, subsessile; perianth purplish-blue, the tube elongated, cylindrical; lobes erect, connivent, the outer ones rather thick, tomentose at back, the inner ones shorter; stamens affixed to the throat, shorter than the perianth; spathes usually twin in the axils of the upper bracts. June. *l.* erect, ensiform, equitant, rather rigid; upper ones smaller, clustered. Stem tall, branched, compressed, acutely angled. South Africa, 1803. (B. 125; B. R. 5; F. d. S. 72; P. M. B. viii., p. 221.)

WITTEBROOM. *See* **Leucadendron.**

WITTELSBACHIA. A synonym of **Cochlospermum** (which *see*).

WOAD, DYER'S. *See* **Isatis tinctoria.**

WOAD, WAXEN. A common name for **Genista tinctoria** (which *see*).

WOAD, WILD. A common name for **Reseda Luteola** (which *see*).

WOLF BERRY. *See* **Symphoricarpus occidentalis.**

WOLF CHOP. A common name for **Mesembryanthemum lupinum** (which *see*).

WOLF'S BANE. *See* **Aconitum.**

WOLF'S BANE, WINTER. *See* **Eranthis hyemalis.**

WOLF'S CLAW. A common name for **Lycopodium clavatum** (which *see*).

WOLF'S MILK. *See* **Euphorbia.**

WOLLASTONIA. Included under **Wedelia** (which *see*).

WOMAN'S-CAP ORCHID. *See* **Thelymitra.**

WONGA-WONGA VINE. *See* **Tecoma australis.**

WOOD. The hard part of a stem, formed chiefly of woody tissue or pleurenchyma.

WOOD ASHES. The Ashes obtained from wood, after all the organic compounds have been destroyed by burning, form a very valuable manure, as they contain potash compounds, and also the other mineral substances that existed in the plants from which they were prepared. These Ashes usually contain the elements in forms that can be made use of by most plants in their nutrition. They are of especial value to the same species as yielded the wood from which they were prepared, since they possess all the mineral elements required by such plants, and, for the most part, in the desirable proportions. The Ashes that remain after weeds are burned may be employed like Wood Ashes, being similar in general composition; but it is usually better economy to make

Wood Ashes—*continued.*

up the weeds into a compost, and to employ them after slow decomposition with urine. Wood Ashes may be applied pure, or may be previously mixed with dung or other organic manures, *e.g.*, guano. They are sometimes made use of against insect depredations, either dusted without mixture on the plants, or mixed with powdered Pyrethrum leaves or Paris Green (Arseniate of Copper).

WOOD BETONY. *See* **Peduncularis canadensis** and **Stachys Betonica.**

WOODBINE. *See* **Lonicera Periclymenum.**

WOODBINE, AMERICAN. A common name for **Ampelopsis quinquefolia** (which *see*).

WOOD-BORING BEES. In many localities where there is a supply of decaying wood in which to form their burrows, these insects are not uncommon. Each female works independently of the others—not, as do Hive Bees and Humble Bees, in societies, for the good of the community. Each digs out a burrow for herself; forms one or more cells in it; stores her cells with pollen or other food suitable for the nourishment of her larvæ; lays an egg in the mass in each cell; closes up the mouth of the latter; and leaves the larva to escape from the egg, to live on the food stored up for it, and to pass through its development. At last the young Bees escape from the cells, and from the burrows when they are fully mature, to repeat the process for the benefit of their own offspring in turn. There are several kinds of Wood-boring Bees found in England, belonging to more than one genus. They show a considerable likeness to the common Hive Bee, so that they might be mistaken for the latter by a casual observer. Some of them burrow not only in decaying wood, but also in old walls, in the ground, or even in soft sandstone. The species of *Megachile* are called "Leaf-cutter Bees," as they cut pieces from the leaves of Roses, or other plants, and employ them in forming the cells for containing the larval food in the burrows. The end of each cell is closed by a set of circular pieces of leaf. Another Wood-borer has had one of its habits recorded by the well-known Rev. Gilbert White, of Selborne. This habit is that of stripping off the hairs from the surface of various plants, shaving the stems bare, as White says, "with all the dexterity of a hoop-shaver," and flying away with a bundle held between its chin and fore legs, almost as large as itself. With the hairs the female collects in this way she forms cells by uniting them with some sticky cement into a substance like felt. The cells are made in burrows dug out of the rotten wood of decaying Willows. This Bee's scientific name is *Anthidium manicatum*.

WOOD-BRONEY. An old name for the Ash (*Fraxinus*).

WOOD FERN. *See* **Polypodium vulgare.**

WOODFORDIA (named after J. Woodford, who wrote an account of the plants round Edinburgh in 1824). ORD. *Lythrarieæ*. A monotypic genus. The species is a stove shrub, with long, spreading branches. For culture, *see* **Leianthus.**

W. floribunda (bundle-flowered). *fl.* scarlet, in short, panicled cymes on axillary peduncles, rarely solitary; calyx ¼in. to ½in. long, six-toothed; petals six, scarcely longer than the calyx, or wanting. May and June. *l.* 2in. to 4in. long, opposite or nearly so, entire, lanceolate, usually rounded or cordate at base, often grey-pubescent beneath. *h.* 1ft. to 4ft. India, &c. SYNS. *W. tomentosa* (B. F. S. xiv.), *Grislea tomentosa* (B. M. 1906).

W. tomentosa (tomentose). A synonym of *W. floribunda*.

WOOD LEOPARD MOTH. *See* **Zeuzera æsculi.**

WOOD LILY. A common name for *Pyrola minor* and various species of *Trillium*.

WOOD NUT. A popular name for **Corylus Avellana** (which *see*).

WOOD OR SPURGE LAUREL. *See* **Daphne Laureola.**

WOODRUFF, or **WOODROWEL.** A common name for several species of *Asperula.*

WOODSIA (named in honour of Joseph Woods, 1776-1864, author of "The Tourists' Flora"). Including *Hymenocystis* and *Physematium.* ORD. *Filices.* A genus comprising about fourteen species of small, much-tufted, stove, greenhouse, or hardy Ferns, mostly inhabiting cold or temperate climates. Stipes often jointed and separating at the joint. Sori globose; involucre inferior, soft-membranous, from the first calyciform or more or less globose, and sometimes inclosing the sorus, at length opening at the top, the margin or mouth irregular, lobed or fringed. The best-known species are here described. With the exception of *W. mollis*, all the exotic species thrive in a cool house. For general culture, *see* **Ferns.**

W. alpina (alpine). A garden name for *W. hyperborea.*

W. Brownii (Brown's). A synonym of *Hypoderris Brownii.*

W. caucasica (Caucasian). *fronds* lanceolate, 9in. long, glandular-hirsute on the rachis and midrib, firm-membranous, bipinnate; primary pinnæ sessile, nearly opposite, lanceolate, broadest at the base, acuminate-pinnatifid or again pinnate; lobes or ultimate pinnules oblong, acute, serrated. *sori* large, two on each lobe or pinnule, one on each side near the margin; involucre globose. Caucasus. SYN. *Hymenocystis caucasica.*

W. glabella (nearly glabrous). *sti.* short. *fr.* linear, slightly tapering below, pinnate; pinnæ very remote towards the short stipes, all deltoid, very obtuse, cut into from three to seven shortly rounded or sub-cuneate, entire lobes. North America, Norway, 1827. Baker regards this as possibly a glabrous form of *W. hyperborea.* (H. F. B. A. ii. 237.)

FIG. 225. WOODSIA HYPERBOREA.

W. hyperborea (extreme-northern). *rootstock* stout, somewhat elongated. *sti.* shining, clothed with ferruginous scales. *fronds* 3in. to 6in. long, linear-lanceolate, densely tufted; pinnæ somewhat distant, ovate-cordate, ¼in. to ½in. long, pubescent and ciliated, with a few broad lobes. *sori* three to five on each lobe. Arctic Europe (Britain), &c. See Fig. 225. SYN. *W. alpina* (of gardens), (Sy. En. B. 1863.)

W. ilvensis (Elba). *fronds* broadly lanceolate; pinnæ oblong, obtuse, broader at the base, sessile, deeply pinnatifid, with many oblong, sub-crenate lobes. Alpine regions of Northern hemisphere. See Fig. 226. (Sy. En. B. 1862.) Ilva, whence *ilvensis* is derived, is the classical name for the island of Elba. The species received the name because Linnæus believed this Fern

Woodsia—*continued.*

to be the same as one figured by Dalechamp, named *Lonchitis aspera ilvensis.*

FIG. 226. WOODSIA ILVENSIS.

W. mollis (soft).* *fronds* lanceolate, pinnate, generally densely clothed, especially beneath, with short, jointed hairs, scarcely attenuated below; pinnæ sessile from a broader base, oblong, obtuse, pinnatifid; lobes approximate, oval or nearly round, entire or crenate. *sori* marginal; involucre opening with a jagged, circular mouth. Mexico, Guatemala, &c. Greenhouse. SYN. *Physematium mollis.*

FIG. 227. WOODSIA OBTUSA.

W. obtusa (obtuse).* *sti.* tufted, not articulated, 3in. to 6in. long, castaneous towards the base. *fronds* oblong-lanceolate, narrowed to both ends, 6in. to 9in. long, bipinnate or tripinnatifid; central pinnæ sessile, lanceolate-deltoid, 1in. to 1½in. long, the lower ones reduced; pinnules oblong, blunt, crenulate, or the lowest sub-pinnatifid, glandular-pilose. *sori* sub-marginal,

Woodsia—*continued.*

six to twelve to the largest pinnules; involucre a small, membranous, lacerated, white cup. United States to Peru. See Fig. 227. (H. G. F. 43.) SYN. *W. Perriniana.*

W. oregana (Oregon). *sti.* densely tufted, not articulated, castaneous, 2in. to 4in. long. *fronds* oblong-lanceolate, narrowed to both ends, 3in. to 4in. long, bipinnate, glabrous; pinnæ lanceolate, sessile, the central ones ⅜in. to ½in. long, cut down to the rachis or a narrow wing into blunt, oblong, crenate lobes, the lower ones distant, gradually reduced; rachis stramineous. *sori* sub-marginal; involucre hidden by the sorus. North America. Closely allied to *W. obtusa.*

W. Perriniana (Perrin's). A synonym of *W. obtusa.*

W. polystichoides (Polystichum-like).* *fronds* 9in. long, opaque, lanceolate, pinnate, sparsely subulate-squamulose; pinnæ spreading, approximate, sessile, 6in. to 8in. long, lanceolate, acute, cuneate-truncate at base, acutely auricled at the superior base, entire or obsoletely crenate at the apex, indistinctly costate. *sori* marginal in a distinct line or series; involucre globose, of four or five ciliated, incurved scales. Japan, 1863.

W. p. sinuata (sinuate). *fronds*, pinnæ broader, more obtuse, lobed-pinnatifid. (H. G. F. 32, f. 3.)

W. p. Veitchii (Veitch's). *fronds* very villous (H. G. F. 32, ff. 1, 2, 4-6.)

W. scopulina (brush-like). *sti.* densely tufted, 2in. to 3in. long, castaneous below. *fronds* 4in. to 6in. long, oblong-lanceolate, bipinnate, narrowed from the middle to both ends; central pinnæ lanceolate, sessile, ⅜in. to ½in. long, cut down to the rachis or a narrow wing into close, ligulate-oblong, crenate-pinnatifid lobes; upper surface slightly, lower densely, glandular-pilose, with a few minute scales on the ribs. Rocky Mountains, 1884. "Scarcely more than a variety of *S. obtusa*" (Baker).

WOOD SORREL (*Oxalis Acetosella*). A hardy, native perennial, occasionally cultivated for the use of its young leaves in salads. It should be cut over frequently, and not allowed to produce seed in gardens, or else the seedlings may become troublesome weeds. A cool, shady place is best suited, but the plant is seldom cultivated. If a few specimens are desired, they are best procured in spring and transplanted from places where they grow naturally.

WOOD SOWER. An old name for the common Wood Sorrel (*Oxalis Acetosella*).

WOOD TIGER MOTH. *See* **Tiger Moths.**

WOOD-TONGUE FERN. *See* **Drymoglossum.**

WOOD VIOLET. *See* **Viola sylvatica.**

WOODWARDIA (named after Thomas Jenkinson Woodward, an English botanist). Chain Fern. Including *Anchistea* and *Lorinseria.* ORD. *Filices.* A small genus (about half-a-dozen species) of highly decorative, greenhouse or half-hardy Ferns, belting the world in the North temperate zone, extending very slightly within the tropics. Fronds usually ample and bipinnatifid. Sori linear or linear-oblong, sunk in cavities of the frond, placed in single rows parallel with, and contiguous to, the midribs of the pinnæ and pinnules; involucre sub-coriaceous, the same shape as the sorus, closing over the cavity like a lid. Woodwardias thrive in any well-drained, light, rich soil, and require plenty of water, both at the roots and overhead, during the summer months. They succeed well if planted out in the conservatory border, and grow much more vigorously than in pots. For general culture, *see* **Ferns.**

Woodwardia—*continued.*

W. angustifolia (narrow-fronded). A synonym of *W. areolata.*

W. areolata (areolate).* *barren fronds* 9in. to 12in. long, 6in. to 8in. broad, on a slender stipes, deltoid-ovate, with numerous oblong-lanceolate, sinuated pinnæ on each side, the lower ones 3in. to 4in. long, ½in. to ¾in. broad, reaching down to the rachis, which above has a broad wing; both surfaces naked. *fertile fronds* on an elongated, strong, erect, chestnut-brown, naked stem; pinnæ 3in. to 4in. long, narrow-linear, ½in. to 1in. apart. United States, 1812. See Fig. 228. (H. G. F. 61.) SYN. *W. angustifolia*

FIG. 228. BARREN FROND OF WOODWARDIA AREOLATA.

W. Harlandii (Harland's). *sti.* 6in. to 18in. long, erect, nearly naked. *barren fronds* varying in shape from linear-lanceolate, undivided, to broadly ovate, with one or two spreading, linear-lanceolate lobes, 3in. to 4in. long, ½in. to ¾in. broad, reaching down to a broadly-winged rachis; both surfaces naked. *fertile fronds* with more numerous and narrower lobes, the lowest pair often quite free of the others. *sori* in broad lines close to the midrib of the lobes, with short lines branching from these in an erecto-patent direction. Hong Kong.

W. japonica (Japanese). *sti.* 6in. to 12in. long, erect, scaly below. *fronds* broadly ovate, 1ft. to 1½ft. long, 9in. to 12in. broad; pinnæ lanceolate, often 6in. long, 1in. to 1½in. broad, reaching half or two-thirds of the way down to the rachis, the lines of sori which margin the midrib of the pinnæ confined to the upper part of the upper ones. China and Japan.

W. orientalis (Eastern). *sti.* erect, densely scaly at base. *fronds* 4ft. to 8ft. long, 1ft. to 1½ft. broad; pinnæ lanceolate, sometimes more than 1ft. long, cut down below nearly to the

Woodwardia—*continued.*

rachis into sinuated or pinnatifid pinnules, sometimes 4in. long, those of the under side shorter, and none at the base of the pinnæ; veins copiously anastomosing outside the sori; upper surface often producing copious, gemmiferous buds. Japan to Formosa. Closely allied to *W. radicans*.

W. radicans (rooting).* *sti.* strong, erect, naked, scaly at base. *fronds* 3ft. to 6ft. long, 1ft. to 1½ft. broad; pinnæ lanceolate, the lower ones often 1ft. long, cut down below within a short distance of the rachis into finely-toothed, lanceolate pinnules 1in. to 1½in. long, those of the under side the shortest; veins anastomosing once outside the line of fruit; gemmæ few and large, placed at the base of the upper pinnæ. Canaries, South Europe, &c., 1779.

W. r. cristata (crested).* A handsome variety, with regularly and symmetrically crested pinnæ. 1878.

FIG. 229. PINNA OF FERTILE FROND OF WOODWARDIA VIRGINICA.

W. virginica (Virginian). *sti.* strong, erect, 1ft. to 1½ft. long. *fronds* oblong-lanceolate, 1ft. to 1½ft. long, 6in. to 9in. broad; pinnæ linear-lanceolate, 4in. to 6in. long, ¾in. to 1in. broad, cut down within one line or less of the rachis into linear-oblong lobes, which are two to three lines broad at the base, the lines of sori which margin the midrib of the pinnæ often reaching low down in the lower ones. Canada, southward, 1774. See Fig. 229.

WOOD, WAXEN. A common name for **Genista tinctoria** (which *see*).

WOODY NIGHTSHADE. *See* **Solanum Dulcamara.**

WOOLLEN. An old name for Mullein (*Verbascum*).

WOOLLEN RAGS. Occasionally, these are used as manure. They should be torn or cut up into shreds, and dug into the soil. There they decay slowly, and decompose into substances useful to plants, ammonia being formed, among other products. Owing to their slow decay, their effects are perceived for two or three years. Their action as manure is hastened by steeping them for some months in Sulphuric Acid or Oil of Vitriol; but their fertilising influence ceases more quickly after this treatment. Woollen refuse and rags are made great use of in Kent as manure for Hops, after having been made up for some time in a compost.

Woollen Rags—*continued.*

WOOLLY APHIS (*Schizoneura lanigera*). An insect more often called the **American Blight** (which *see*). A few particulars may be added to the account already given of this very dangerous pest to Apple-trees. The wingless females are oval and flattened, with deep constrictions between the body-rings. In general appearance they much resemble blackish-brown Aphides; but the antennæ and limbs are very short, the tail is very small, and the two honey-tubes are extremely small. These wingless females live on the bark, sucking its juices, and produce multitudes of living larvæ, like themselves on a smaller scale. In autumn, winged viviparous females also are found, differing from the wingless females in little but the possession of wings. The winged females produce small, ill-developed insects, of which each gives birth to one egg for the continuance of the species during winter. The larvæ seem to suffer very little from the action of low temperatures, as they are protected under the cottony excretions with which they cover themselves. It is said that in winter they fix themselves on the roots of Apple-trees, and suck the sap from them, returning to the branches in spring. The pupæ are like the winged females, except in having the wings represented only by little scales. The males are small, and, like the winged females, are unable to suck, as the beak is undeveloped.

The popular name (American Blight) points to the belief that this insect has been imported from America into Europe. The earliest European record of its occurrence dates from 1787. In England, it was first observed in a nursery, near London, in which were Apple-trees recently imported from North America. It soon spread, with disastrous results, into the orchards of Devonshire. In Germany it was first observed in 1801, in France and Belgium in 1812. It is now plentiful in many parts of Europe. It feeds on the wild Crab Apple of North America; but several leading American entomologists believe that it has been carried from Europe to America, and not in the reverse direction, as generally supposed.

Remedies. A number of the more highly recommended remedies are mentioned under **American Blight.** The most important point to attend to is the thorough cleansing of the branches, by the aid of a thick brush and any good insecticide, *e.g.*, soft soap in water, alone or mixed with crude carbolic acid of such a strength that the acid does not separate as oily drops when the soap is mixed with water. Usually, about one part of acid to ten of soap is sufficient, thoroughly mixed before water is added. The solution may be used moderately strong to the older branches, weaker to the younger ones. Kerosene may be used instead of the above—Professor Comstock states that he has sprayed it pure on plants, without injury to them—but it is usually employed diluted with four or five times its bulk of water; in this strength it may be applied to the branches without risk of injury. Another useful remedy is employed thus: Towards the end of autumn, or in winter when the weather is mild, the earth for about 3ft. from the tree is thrown back from the old roots, and one or two pailfuls of lime-water, or of lye of wood ashes, is poured in; then about 1in. of newly-slaked lime is scattered in, and the earth is replaced. All small branches on which the insect is established should be cut off and burned.

WORM GRASS. *See* **Spigelia marilandica.**

WORMIA (named in honour of Olaus Wormius, a famous Danish philosopher and naturalist). SYN. *Lenidia.* ORD. *Dilleniaceæ.* A genus comprising nine species of stove trees; one is found in the Mascarene Islands, another is Australian, and the rest inhabit tropical Asia. Flowers showy, disposed in terminal, often few-flowered panicles;

Wormia—*continued.*

sepals five, spreading; petals five; stamens nearly free. Leaves ample, parallel-penniveined. Only two species have been introduced. They thrive in a light, sandy loam. Cuttings of half-ripened wood root readily, if inserted in sand, under a glass, in bottom heat.

W. Burbidgei (Burbidge's).* *fl.* pale golden-yellow, 3in. in diameter, sub-cymose on a simple peduncle 2in. to 4in. long; petals obovate-oblong, with broadly undulated margins; stamens almost white. July. *l.* 8in. to 10in. long, almost exactly elliptic, the base contracted and decurrent as a very broad petiole, 1in. to 1½in. long, which expands and is amplexicaul at base. Branches terete. North Borneo. (B. M. 6531.)

W. dentata (toothed). A synonym of *W. triquetra.*

W. triquetra (triquetrous). *fl.* white, 2in. in diameter, in subterminal, leaf-opposed, secund, few-flowered racemes; pedicels 1in. long, thickened upwards. May. *l.* broadly oval, 5in. to 8in. long, repand-toothed or sinuated, the tip obtuse or subtruncate, the base rounded; petioles with broad, sheathing, deciduous wings. *h.* 20ft.; Ceylon, 1818. SYN. *W. dentata.*

WORMS. Under this name will be discussed only the Earth Worms, since the Nematoid Worms have been already treated of. The Earth Worms all belong to the genus *Lumbricus;* but many species have been named and described. Their general appearance is too well known to call for description. They possess two rows of bristles along the sides of the body, so short as to be almost invisible, but stiff, and adapted for enabling the Worms to move by their aid; they can be felt on drawing a finger along the sides of the body from behind forwards. On damp evenings and nights the Worms stretch out of their holes to seize on food, and to drag it into their burrows. The trembling of the soil due to footsteps, or the approach of a light, causes a very rapid retreat into their holes. In winter, and in very dry weather, they burrow deep into the soil, beyond the reach of cold and droughts. They feed on decaying vegetable substances, and swallow much earth to obtain such remains of plants as are in it. The earth, after the vegetable matter is digested by the Worm, is ejected close to the opening of the burrow in the form known to all gardeners as "worm-castings."

In most cases, Worms ought to be regarded as useful creatures, since they constantly renew the surface soil with finely-divided earth brought from the subsoil, and, by means of their burrows, allow the free penetration of rain and air to greater depths than would otherwise be reached. They also promote the more rapid decay of the vegetable remains in the soil. But, on the other hand, they are obnoxious on lawns and in flower borders, because of the untidy appearance of their castings, and of the pieces of leaves, paper, and other things dragged partially into their burrows. They also disfigure plants by dragging in the ends of living leaves. When they get into flower-pots, they are troublesome or hurtful, and should be ejected.

Remedies. After or during mild, warm showers in the dusk of evening, Worms crawl out in large numbers from their holes in search of food, and can be collected by the aid of a lantern; but the operation must be quickly performed, for the reason above stated. Watering the soil—whether in a flower-pot, lawn, or flower border—with a weak solution of smelling salts or Carbonate of Ammonia causes the Worms to come to the surface in a nearly helpless state; and an infusion prepared from Walnut leaves has the same effect. This should be done in the evening. An undue increase in their numbers may be checked by keeping in gardens such creatures as hedgehogs, shrew-mice, frogs, and the *Testacella* slugs, which feed largely on Worms.

WORMWOOD (*Artemisia Absinthium*). A hardy perennial, grown for the use of its leaves and tops medicinally; they are intensely bitter. The plants prefer a somewhat sheltered, rather dry position; very few specimens are generally sufficient. Propagated by seeds, cuttings, and division of the roots, in spring.

WOUNDS. These are often caused in fruit and other trees by an improper use of a knife or hammer, also by friction, *e.g.*, when two branches rub against each other, and in many other ways. Wounds are invariably longer in getting callused and grown over than clean cuts; hence care should specially be taken to prevent any being made in the bark of trees, &c., for want of proper attention or appliances.

WOUNDWORT. *See* **Anthyllis Vulneraria** and **Stachys.**

WOUNDWORT, HERCULES'. A common name for **Heracleum** (which *see*).

WREATH. A floral head-dress which goes all round the head. It is generally made up of choice flowers of rather small or medium size. Another kind of Wreath is that made, in various sizes, of fresh or dried flowers, for funerals, &c. The outline is circular; and a framework upon which to fasten the flowers may easily be made with a piece of strong wire, or of thin board or cardboard, cut into the size and shape desired. Either green moss or sprigs of Myrtle or Box may be bound round to cover the frame before the flowers are arranged.

WREATHEWORT, PURPLE. A common name for **Orchis mascula** (which *see*).

WREATH, PURPLE. *See* **Petræa volubilis.**

WRIGHTIA (named after William Wright, 1740-1827, a Scotch physician and botanist). Palay or Ivory-tree. SYN. *Balfouria.* ORD. *Apocynaceæ.* A genus including about a dozen species of stove shrubs or small trees, with often slender, cord-like branches, natives of tropical Africa, Asia, and Australia. Flowers red, white, or yellow, in terminal or sub-axillary, sessile cymes; calyx short, five-parted, with glands or scales inside; corolla salver-shaped, the tube cylindric, usually short, the throat with one or two series of usually fimbriated scales; stamens at the top of the tube; filaments short, dilated. Leaves opposite, penniveined. The best-known species are here described. They thrive in a mixture of peat, loam, and sand. Cuttings root readily if inserted in sand, in heat.

W. coccinea (scarlet).* *fl.* dark red, 1in. in diameter; corolla thick, almost fleshy; scales crimson; cymes three or four-flowered. July. *l.* elliptic or elliptic-lanceolate, 3in. to 5in. long, membranous, obtusely caudate-acuminate, acute at base; petioles very short. *h.* 12ft. and upwards. India, 1822. A glabrous or pubescent tree. (B. M. 2696.) SYN. *Nerium coccineum* (L. B. C. 894).

W. dubia (doubtful). *fl.*, corolla lobes yellow outside, orange-red within, ten lines long, spreading, acuminate; pedicels rather shorter than the flowers; cymes three-flowered, glabrous. June. *l.* ovate-lanceolate, 3in. to 4in. long, glabrous, slightly undulated, rather obtusely acuminate. Native country uncertain, 1813. Shrub. SYN. *Cameraria dubia* (B. M. 1646).

W. pubescens (downy). *fl.* white, sessile or shortly pedicellate; cymes terminal, trichotomous, corymbose, not exceeding the leaves; corolla tube scarcely exceeding the calyx, the lobes twice as long. March. *l.* shortly petiolate, ovate to elliptic-oblong, acuminate, 2in. to 4in. long. North Australia, 1829. A pubescent or velvety-tomentose, tall shrub or small tree.

W. tinctoria (dyers'). Pala Indigo-plant. *fl.* white, ¼in. to ⅜in. in diameter; cymes sometimes 5in. in diameter, with slender, spreading, dichotomous branches. Summer. *l.* elliptic-ovate, elliptic-lanceolate, or obovate-oblong, 3in. to 5in. long, obtusely acuminate or caudate, acute or rounded at base; petioles very short. India, 1812. A small, glabrous tree. (B. F. S. 241; B. R. 933.)

WRIGHTIA (of Roxburgh). A synonym of **Wallichia** (which *see*).

WULFENIA (named in honour of Francis Xavier Wulfen, 1778-1825, a botanical author). ORD. *Scrophularineæ.* A small genus (four species) of hardy, glabrous or scarcely pilose, perennial herbs, with a thick rhizome, natives of Carinthia, Western Asia, and the Himalayas. Flowers blue, ebracteolate, nodding, solitary in the axils of the bracts, racemose or spicate at the tops of the scapes; calyx five-parted; corolla tube exserted, cylindrical; limb of four erecto-patent, imbricated lobes, the

Wulfenia—*continued.*

upper one emarginate or bifid, the lower one entire or crenate; stamens two; peduncles scape-like, simple, with a few alternate scales. Leaves sub-radical, petiolate, crenate. The two introduced species are well adapted for the rockery, or for ornamenting well-drained but moist flower borders, being very showy when in blossom. Any light, rich soil is suitable; the protection of a frame in winter is desirable, as the plants are liable to rot if left in the open air at that season. Propagation may be effected by divisions, or by seeds.

W. Amherstiana (Amherst's).* *fl.* horizontal; corolla ½in. long, with lanceolate, acute lobes; pedicels shorter than the calyx; racemes long, slender, very many-flowered; scapes 5in. to 10in. long, slender. July. *l.* obovate-oblong or obovate-spathulate, 2in. to 5in. long, coarsely crenate or lobulate, narrowed at base and sub-pinnatifid; petioles ½in. to 1½in. long. Himalayas, 1846.

W. carinthiaca (Carinthian).* *fl.*, corolla tube ½in. long, the limb shorter, the upper segments bifid, the lower sub-crenate; pedicels much shorter than the calyx; raceme dense, spike-like, at length elongated; scape 1ft. to 2ft. long, scaly below. July. *l.* oblong or oboval-oblong, doubly-crenate, slightly lobed, narrowed at base; radical ones few, 3in. to 8in. long. Carinthian Alps, 1817. (B. M. 2500; S. B. F. G. 66.)

WULFFIA (named in honour of John C. Wulff, who died in 1767, author of "Flora Borussica"). SYNS. *Chakiatella, Chylodia, Tilesia.* ORD. *Compositæ.* A small genus (eight species have been described, but all are not distinct as such) of tropical American, stove, scabrous-pubescent, perennial herbs. Flower-heads yellow, at first depressed, at length globose, pedunculate, solitary or three to seven in a corymb; involucre hemispherical, with two or three series of bracts; receptacle slightly convex, the pales enveloping the florets; ray florets, when present, entire or minutely toothed; achenes glabrous or slightly pilose. Leaves opposite, petiolate, crenate-serrated. *W. maculata*, the only species introduced, is of easy culture in any light soil. Propagation may be effected by seeds, or by divisions.

W. maculata (spotted). *fl.-heads* orange-yellow; ray florets about eight, twice as long as the involucre; peduncles ternate, terminal. June. *l.* oblong-lanceolate, cuneate at base, acuminate at apex, serrated, scabrous above, nearly glabrous beneath. Stem erect, tetragonal, spotted. *h.* 3ft. Brazil, 1822. SYN. *Gymnolomia maculatum* (B. R. 662).

WULLSCHLÆGELIA (named after Herr Bischoff Wullschlægel, who collected *W. aphylla* in Jamaica). ORD. *Orchideæ.* A small genus (two species) of stove, terrestrial, leafless Orchids, found in the West Indies and Brazil. Flowers very small, in loose, sub-sessile spikes; lip sessile at the base of the column, erect, concave, the base produced in a pouch or spur. Stems simple, with a few small scales. The species are of no horticultural value.

WURMBEA (named in honour of F. van Wurmb, Secretary to the Academy of Sciences at Batavia). ORD. *Liliaceæ.* A genus consisting of seven species of greenhouse plants, with tunicated bulbs or corms, natives of South Africa and Australia. Flowers ebracteate, sub-sessile, in a short, terminal, pedunculate spike; perianth sub-campanulate or expanded nearly from the base, persistent, the lobes longer than the tube, sub-equal, spreading; stamens six. Leaves few, linear- or rarely ovate-lanceolate, continuous with the sheaths. *P. campanulata* and its varieties, the only plants calling for description here, are pretty subjects when in flower. They thrive in a compost of sandy peat and a little loam. Propagation may be easily effected by seeds, or by offsets.

W. campanulata (bell-shaped). *fl.*, perianth pallid, 4in. to 6in. long, the tube campanulate, the segments lanceolate, acute, black-glandular above the base; spikes 1in. to 3in. long, loose- or dense-flowered. May and June. *l.* three or four, firm; lower ones linear, 3in. to 9in. long; upper ones lanceolate, dilated at base, embracing the stem. Bulb ovoid; tunic brown. *h.* 6in. to 12in. South Africa, 1819. SYN. *Melanthium monopetalum* (B. M. 1291). *W. purpurea* (A. B. R. 221; B. M. 694) is regarded, by Baker, as a form of this species; it has a lurid-purple perianth, the segments equalling or exceeding the campanulate tube.

Wurmbea—*continued.*

W. c. longiflora (long-flowered). *fl.*, perianth pale, ½in. to ¾in. long, the segments equalling or shorter than the cylindrical tube. 1788. A robust variety. *W. pumila* is a dwarf form of this, with three or four flowers in a spike, and linear leaves.

W. pumila (dwarf). A form of *W. campanulata longiflora.*

W. purpurea (purple). A form of *W. campanulata.*

WÜRTHIA. A synonym of **Ixia** (which *see*).

WYCH ELM. *See* **Ulmus glabra** and **U. montana.**

WYETHIA (so called after N. B. Wyeth, the discoverer of this genus in the mountains of North America). SYN. *Alarconia, Melarhiza.* ORD. *Compositæ.* A genus of seven species of hardy, perennial, North American herbs, with a thick caudex. Flower-heads yellow, large, heterogamous, radiate; involucre hemispherical, the bracts in two or three series, scarcely unequal; receptacle flat or slightly convex; ray florets ligulate, spreading; disk florets shortly five-cleft at apex; achenes glabrous. Leaves radical or alternate, entire. Stem often simple and one-headed. Only one species calls for mention here. For culture, *see* **Helianthus.**

W. angustifolia (narrow-leaved). *fl.-heads* yellow, solitary; scales of involucre mostly foliaceous, lanceolate or broader, equalling the disk; involucre fully 1in. high, loose or spreading; rays numerous, 1½in. long. Autumn. *l.*, radical ones stalked, elongated-lanceolate, tapering to both ends, occasionally dentate or serrate, often undulate; cauline ones sessile, broader. *h.* 6in. to 2ft. United States.

WYMOT. An old name for Marsh Mallow (*Althæa*).

XANTHISMA (from *xanthisma*, yellowness; alluding to the colour of the flowers). SYN. *Centauridium.* ORD. *Compositæ.* A monotypic genus. The species is a hardy, annual or biennial herb. Seeds should be sown in the open border, during April.

X. texanum (Texan). *fl.-heads* wholly yellow, heterogamous, mediocre, solitary, at the tips of the branches; involucre broadly campanulate, or at length sub-globose, the imbricated bracts in several series; receptacle flat, strongly fimbrilliferous; achenes glabrous; pappus reddish, shining. Summer. *l.* alternate, linear-lanceolate, entire, pale, erect, sessile, about 1in. long. *h.* 1½ft. to 2½ft. Texas, 1877. (B. M. 6275.)

XANTHIUM (the old Greek name used by Dioscorides, from *xanthos*, yellow; the plants were formerly used by the Greeks for dyeing hair). Cockle Bur; Clot Bur. ORD. *Compositæ.* A genus consisting of about four species of hardy, annual herbs, dispersed over warm and temperate regions. Flower-heads solitary or glomerate at the axils, unisexual. Leaves alternate, lobed or toothed. The species are of no horticultural value. *X. spinosum* (Bathurst Bur; Spiny Clot-Bur) and *X. strumarium* (Ditch or Louse Bur; Small Burdock) are casual weeds in Britain.

XANTHOCEPHALUM (from *xanthos*, yellow, and *cephale*, a head; alluding to the yellow flower-heads). SYN. *Xanthocoma.* ORD. *Compositæ.* A genus consisting of eight species of greenhouse or hardy herbs or sub-shrubs; one is found in Ecuador, and the rest are Mexican. Flower-heads wholly yellow, rather large or mediocre, solitary or loosely corymbose at the tips of the branches, heterogamous; involucre hemispherical or broadly campanulate, the imbricated bracts in several series; receptacle flat, foveolate; ray florets ligulate, spreading, nearly entire; disk florets five-cleft at apex; achenes glabrous. Leaves alternate, narrow, entire or toothed. Only two species call for mention here. Both thrive in any fairly good soil. *X. centauroides* may be increased by cuttings, and *X. gymnospermoides* by seeds.

X. centauroides (Centaurea-like). *fl.-heads* yellow, solitary; involucre clammy; outer scales spreading. July to September. *l.* sessile, thickish, linear, pinnatifidly toothed, wrinkled, glabrous. *h.* 1½ft. Mexico, 1826. Greenhouse sub-shrub. SYN. *Grindelia coronopifolia.*

Xanthocephalum—*continued.*

FIG. 230. INFLORESCENCE OF XANTHOCEPHALUM GYMNOSPERMOIDES.

X. gymnospermoides (Gymnosperma-like).* *fl.-heads* orange-yellow, about 1in. in diameter, corymbose. September. *l.* 3in. to 6in. long, lanceolate, linear, and small above, the lower ones sub-spathulate and serrated towards the point, the rest entire. *h.* 2ft. to 4ft. New Mexico, 1859. Hardy annual. See Fig. 230. SYN. *Gutierrezia gymnospermoides* (B. M. 5155).

FIG. 231. FRUITS OF XANTHOCERAS SORBIFOLIA.

XANTHOCERAS (from *xanthos*, yellow, and *keras*, a horn; alluding to the yellow, horn-like glands or nectaries between the petals). ORD. *Sapindaceæ*. A monotypic genus. The species is a small, hardy tree, thriving in any light garden soil. It is difficult to propagate in any other way than from seeds; but root-cuttings sometimes succeed.

X. sorbifolia (Sorbus-leaved). *fl.* white, with blood-red streaks at the base, large, regular, polygamous; sepals five, equal, boat-shaped, imbricated; petals five, elongated, clawed, without scales; disk cup-like; stamens eight; pedicels long, bracteate at base; racemes simple, terminal. *fr.* three-celled, the size of an apple. *l.* alternate, exstipulate, imparipinnate; leaflets serrated. *h.* 5ft. to 15ft. China, 1870. See Fig. 231. (B. M. 6923; F. d. S. 1899; G. C. n. s., v., p. 565, and xxvi., p. 205; I. H. 1877, 295; R. H. 1872, p. 291.)

FIG. 232. XANTHOCHYMUS PICTORIUS.

XANTHOCHYMUS (from *xanthos*, yellow, and *chymos*, juice; the plants contain an abundance of yellow juice). SYN. *Stalagmites*. ORD. *Guttiferæ*. A small genus (four species) of stove trees, with the habit of *Garcinia* (under which *Xanthochymus* is included by Sir J. D. Hooker, in his "Flora of British India"), inhabiting tropical Asia and Africa, and Madagascar. Sepals and petals five, very rarely four; filaments connate in five, rarely four, erect, distant, pedicellate, spathulate bodies. Berry indehiscent. Three of the species have been introduced. They thrive in a compost of loam and

Xanthochymus—*continued.*

peat; and may be propagated by cuttings of ripened shoots, inserted in sand, under a glass, in strong bottom heat.

X. dulcis (sweet-fruited). *fl.* cream-white, in fascicles; petals conniving in a globular form; peduncles scarcely longer than the flowers. February. *fr.* bright yellow, smooth, the size of an apple, with copious yellow pulp, palatable and good. *l.* opposite, 6in. or more long, oblong, acuminate, coriaceous, entire, bright glossy green, paler beneath. *h.* 20ft. Molucca Islands, 1820. (B. M. 3088.)

X. ovalifolius (oval-leaved). *fl.* white, ¼in. to ½in. in diameter, the males and females often mixed in one fascicle, but usually the females are fascicled and the males spiked. Summer. *fr.* deep green, the size of a walnut. *l.* sub-orbicular to lanceolate, obtuse, 3¼in. to 8½in. long. India. A middling-sized tree. SYN. *Garcinia ovalifolia.*

X. pictorius (painter's).* *fl.* white; males ⅜in. in diameter, in four to eight-flowered fascicles from the axils of fallen leaves; hermaphrodite ones like the males. Summer. *fr.* dark yellow, the size of an apple, globose, pointed. *l.* linear-oblong or oblong-lanceolate, 9in. to 18in. long, coriaceous, shining, reticulated. Trunk straight. *h.* 40ft. India. This tree yields a large quantity of indifferent gamboge. See Fig. 232. (B. F. S. 88; R. H. 1881, p. 13.) SYN. *Garcinia Xanthochymus.*

XANTHOCOMA. A synonym of **Xanthocephalum** (which *see*).

XANTHOCROMYON. A synonym of **Trimezia** (which *see*).

XANTHORHIZA (from *xanthos*, yellow, and *rhiza*, a root; alluding to the bright yellow colour of the long roots and rootstock). SYN. *Zanthorhiza.* ORD. *Ranunculaceæ.* A monotypic genus. The species is a hardy, dwarf shrub or under-shrub. It thrives in common garden soil, and may be increased by suckers.

X. apiifolia (Apium-leaved). *fl.* dark purple, small, often polygamous, in slender, compound racemes, appearing before (and under) the leaves; sepals five, petaloid; petals five, small, clawed, often dilated at apex. March and April. *l.* pinnate, long-petiolate; leaflets three to five, ovate and lanceolate-ovate, incisely lobed and toothed from near the acute base. Stems 2ft. to 3ft. high. North America, 1766. (B. M. 1736; B. M. Pl. 9.)

XANTHORRHŒA (from *xanthos*, yellow, and *rheo*, to flow; referring to the resinous juice extracted from the plants). Black Boy; Grass Gum-tree; Grass-tree. ORD. *Juncaceæ.* A genus embracing eleven species of greenhouse, long-lived perennials, with a thick, woody caudex, all natives of Australia. Perianth persistent, of six distinct segments; stamens six; scape or peduncle terminal, hard, often several feet long, terminating in a dense, cylindrical spike of numerous sub-sessile flowers, closely packed with numerous bracteoles surrounding each flower within a small or subulate, subtending bract. Leaves in a dense tuft at the top of the caudex, long-linear, brittle, spreading or recurved, their broader, closely imbricated bases remaining long persistent. Caudex of several species emitting a copious, dark or yellow, resinous gum (the former kind called Black-boy Gum, and the latter Botany Bay or Acaroid Resin). Some of these plants form conspicuous features in Australian landscapes. Those best known to cultivation are here described; all have white flowers, appearing in spring. They thrive in a compost of peat and loam, and may be increased by offsets.

X. arborea (tree-like). Botany Bay Gum. *fl.*, perianth segments about ¼in. long, three-nerved; spike 3ft. to 4ft. long, 1in. to 1½in. in diameter; scape 5ft. to 6ft. long. April. *l.* flat or triquetrous, 3ft. to 4ft. long, two or three lines broad. Caudex attaining several feet in height, with a diameter of 6in. to 9in.

X. australis (Southern). *fl.*, spike, when full grown, upwards of 2ft. long, nearly 1½in. in diameter; scape usually about 2ft. high. Summer. *l.* about 2ft. long, one line or rather more broad, somewhat flat, but with the dorsal angle, and sometimes also the facial one, prominent. Caudex elongated, but rarely exceeding 2ft. in height. 1824.

X. bracteata (conspicuous-bracted). *fl.*, spike usually 4in. to 6in. long, ½in. or sometimes ⅝in. in diameter; subtending bracts subulate and very conspicuous in the young spike; scape 2ft. to 3ft. high. Summer. *l.* about 2ft. long, one line or rather more broad, concave above, the dorsal angle slightly projecting in the lower part, tapering upwards into a narrow, triquetrous point. Caudex very short. 1810.

Xanthorrhœa—*continued.*

X. hastilis (spear-like). *fl.*, spike 1¼ft. to 2ft. long, a dense, rusty tomentum covering the ends of the bracts and outer perianth segments; scape often 6ft. to 8ft. long below the spike. *l.* 3ft. to 4ft. long, two to three lines broad, flat in front, but with the dorsal angle more or less prominent. Caudex very short, or often scarcely prominent. 1803. (B. M. 4722; F. d. S. 868.)

X. minor (lesser). *fl.*, spike 3in. to 6in., rarely 7in. or even 8in., long, seven to eight lines in diameter when fully out; scape, when full grown, often longer than the leaves. *l.* crowded on the caudex, 1ft. to 2ft. long, one to nearly two lines broad, flat but thick, or more or less triquetrous. Caudex short and thick. 1804. (B. M. 6297.)

X. Preissii (Preiss').* *fl.*, perianth segments about ¼in. long, the outer ones oblong, the inner ones broader; spike 1in. in diameter; scape 2ft. to 6ft. long (including the spike, which occupies half to nearly the whole length). April. *l.* from a short, flat base, 2ft. to 4ft. long, one to two lines broad, rigid, very brittle when young. Caudex thick and simple, short, or attaining 5ft. to 6ft. (sometimes, according to Oldfield, as much as 15ft.). (B. M. 6933.)

X. quadrangulata (quadrangular). *fl.*, spike 3ft. to 4ft. long, 1¼in. in diameter when in flower; scape as long, or longer. *l.* slender but rigid, 1½ft. long, strictly quadrangular, though sometimes slightly flattened, rarely above one line broad. Caudex lengthening out to several feet. 1874. (B. M. 6075.)

XANTHOS. This term, used in Greek compounds, signifies such yellow as gamboge; *e.g.* Xanthophyll, the yellow colouring matter of plants.

XANTHOSIA (from *xanthos*, yellow; alluding to the yellow down with which some of the species are covered). SYN. *Leucolæna.* ORD. *Umbelliferæ.* A genus comprising seventeen species of greenhouse herbs or small shrubs, diffuse or decumbent at the base, or erect, often clothed with long, soft hairs, mixed with a stellate tomentum, natives of Australia. Calyx lobes peltate, cordate, or not attached by the whole of the base; petals with an induplicate point and reduplicate margins; umbels usually compound, the partial ones with two or three bracts, and several almost sessile flowers, the general one of three or four rays, and as many bracts, but sometimes the whole umbel reduced to very few, or to a single flower. Leaves toothed, lobed, or ternately divided. The two species introduced require similar treatment to **Trachymene** (which *see*).

X. hirsuta (hairy). A synonym of *X. pilosa.*

X. montana (mountain-loving). A synonym of *X. pilosa.*

X. pilosa (pilose). *fl.* white; peduncles usually two at the nodes, each usually with two flowers, more rarely three or only one, with two or three short, narrow bracts forming a general involucre at the base of the short pedicels or rays. June. *l.* coarsely sinuate-toothed, three or five-lobed or rarely three-parted, the central lobe always longer than the lateral ones, rarely exceeding 1in. in length. *h.* 1ft. to 2ft. 1826. An erect, or more frequently diffuse or procumbent shrub. SYNS. *X. hirsuta, X. montana.*

X. rotundifolia (round-leaved).* *fl.* white, rather numerous, on very short pedicels; peduncles long, each bearing a rather large, compound umbel; rays usually four, with a sessile umbellule in the centre: involucral bracts petal-like. June. *l.* shortly petiolate, nearly orbicular, irregularly and acutely toothed, ⅜in. in diameter, glabrous or woolly beneath, especially when young. Stems erect, 1ft. to 2ft. high, often woody at base. 1836. (B. M. 3582.)

XANTHOSOMA (from *xanthos*, yellow, and *soma*, a body; alluding to the large, lobed, depressed, yellow stigma). Including *Acontias* and *Phyllotœnium.* ORD. *Aroideæ* (*Araceæ*) A genus consisting of about twenty-five species of stove, milky, perennial herbs, inhabiting tropical America. Flowers monœcious, the imperfect males between the perfect ones and the females; spathe tube oblong or ovoid, convolute, accrescent, persistent, at length bursting irregularly, the throat constricted, the lamina boat-shaped; spadix inappendiculate, shorter than the spathe, and adnate with it at base; male inflorescence cylindrical or clavate, elongated, the imperfect

Xanthosoma—*continued.*

portion constricted; female shorter, dense-flowered, attenuated above; peduncles one or several, rarely elongated. Leaves sagittate, hastate, or pedatisect, on long

FIG. 233. XANTHOSOMA BARILLETI.

and thick petioles. The best-known species are here described. They thrive in any rich, light, well-drained soil. Propagation is effected by cutting up the stem or rootstock into small portions, and planting these in light soil, or in cocoa fibre, in bottom heat. After a stem has been cut off, a large number of shoots are developed, which strike readily when submitted to the same treatment as that recommended for root-cuttings. Some of the species may be used for sub-tropical work: they should have a sheltered place in a well-drained bed, principally made up of leaf mould, and an abundance of water.

X. auriculatum (eared). *fl.*, spathe greenish outside, white within, 8in. long, the tube ovoid-oblong, the lamina oblong-lanceolate, acuminate; spadix as long as the spathe. *l.* three-lobed, cordate-hastate; middle lobe oblong, acuminate, cuspidate; basal lobes recurved, spreading, oblong or ovate-oblong, twice or thrice as long as the middle lobe; petioles reddish, or green and rufous-striolated or variegated. Brazil, 1869. (R. G. 1869, 603.)

X. Barilleti (Barillet's).* *l.* arranged on a robust petiole attaining 3ft. in length, deeply channelled at its base, which is broadly winged, the whole of a beautiful shining green;

Xanthosoma—*continued.*

blade digitately-palmate, divisions entire, unequal, strongly nerved, the median lobe 1ft. to 1½ft. long, of a dull green. Brazil, 1882. Plant caulescent. See Fig. 233. (R. H. 1882, p. 260.)

X. belophyllum (arrow-leaved) *fl.*, spathe 8in. long, the tube greenish-white within, the lamina pale yellow, acuminate; spadix whitish, much shorter than the spathe. *l.* large, opaque and slightly pruinose above, cinereous or often pale greenish beneath, 1½ft. to 2ft. long, cordate-hastate; middle lobe shortly apiculate; basal ones semi-ovate, slightly acute. Stem short and thick. Venezuela and Guiana.

X. helleborifolium (Hellebore-leaved). *fl.*, spathe 3½in. to 4½in. long, the tube green, ovoid, nearly glabrous, the lamina yellowish-green, oblong-lanceolate, shortly cuspidate; spadix 5in. long; peduncles equalling or slightly exceeding the petioles. *l.* on very long petioles, green, spotted and striated with dark violet, reniform, pedatisect, 8in. to 12in. broad; segments five, nine, eleven, or thirteen, distant, the lateral ones unequally oblong or lanceolate, cuneate towards the base, acuminate at apex, gradually smaller. *h.* 1½ft. to 2ft. Venezuela, &c., 1793. SYNS. *Acontias helleborifolius*, *Arum helleborifolium*.

X. Jacquini (Jacquin's). *fl.*, spathe tube green outside, dark purple within, 2¾in. long, the lamina pale greenish-yellow outside, whitish within, about 4in. long; spadix whitish, sessile, about equalling the spathe; peduncles about 4in. long, nearly ½in. thick. *l.* on long petioles, broadly cordate-sagittate, 1¼ft. to 2ft. long; middle lobes rounded at apex, shortly apiculate; basal ones retrorse, obtuse, half as long as the middle one. Stem thick, about 2ft. high. Venezuela, 1816.

X. Lindeni (Linden's).* *l.* hastate-oblong, 1ft. long, glabrous except the midrib, deep green, the midrib and numerous well-

FIG. 234. XANTHOSOMA VIOLACEUM.

Xanthosoma—*continued.*

marked veins ivory-white; middle lobe oblong, acute; basal ones inequilateral, obtuse, extrorse; petioles rather longer than the blades, sheathing one-third their length. Rhizome tuberous. New Grenada, 1871. A showy, variegated plant. SYN. *Phyllotænium Lindeni* (I. H. 1872, 88).

X. maculatum (spotted). *l.* green, sagittate-triangular; petioles purplish, with a glaucous bloom, and margined on the sheathing portion with white. 1861. A bold-habited plant. SYN. *Alocasia albo-violacea.*

X. Maximiliani (Maximilian's). *fl.*, spathe 8in. to 9in. long, the tube glaucous-purple, green at back outside, within and at the throat blood-purple, ovoid, tumid, the lamina straw-coloured outside, sulphur-white within, the base and margins blood-purple; spadix straw-coloured and dirty orange. *l.* triangular-hastate, of a pleasing green; basal lobes broadly rhomboid. Stem tall. *h.* 5ft. Brazil, 1860.

X. mirabile (wonderful). *fl.*, spathe primrose-yellow, 5in. to 6in. long, curved; spadix somewhat stipitate, shorter than the spathe. *l.* green, spotted with yellow, trisected, 10in. to 12in. long; segments ovate-lanceolate, acute, the lateral ones very inequilateral, shorter than the middle one; petioles three or four times as long as the leaves. Rhizome tuberous. South America, 1874. (G. C. 1874, ii., pp. 258, 259.)

X. plumbea (lead-coloured). A synonym of *Alocasia cuprea.*

X. robustum (stout). *fl.*, spathe 8½in. to 10½in. long, the tube green, the lamina whitish, broadly ovate-lanceolate, acute; spadix whitish, rather shorter than the spathe. *l.* opaque above, paler beneath, pruinose, sagittate-ovate, 1½ft. or more long; middle lobe semi-ovate, acutely cuspidulate; basal ones subrhomboid or oblong, obtuse. Stem 4in. to 8in. long, nearly or quite 2in. thick. Mexico.

X. sagittifolium (sagittate-leaved). Arrow-leaved Spoonflower. *fl.*, spathe 6½in. to 7in. long, the tube greenish, the lamina whitish-green; spadix much shorter, and peduncles longer, than the spathe. *l.* 16in. to 20in. long, broadly sagittate-ovate, pruinose; middle lobe broadly semi-ovate, acuminate-apiculate, twice as long as the acute basal ones. Stem thick, erect, 3ft. or more high. West Indies, 1710. (B. M. 4989.)

X. violaceum (violet).* *fl.*, spathe tube glaucous and pale violet outside, yellowish-white within, oblong, 4in. long, the lamina sulphur-white, 6in. long; spadix violet and white, 7½in. long; peduncles 6in. to 8in. long. *l.* pruinose, at length green, paler beneath, 8in. to 16in. long, sagittate-oblong-ovate; middle lobe shortly acuminate-apiculate; basal ones a third or a quarter as long, sub-triangular; petioles brownish-violet, nearly twice as long as the blades. Rhizome short. West Indies, 1864. See Fig. 234.

X. Wallisii (Wallis'). *l.* large, hastate, of a rich dark green; veins white, or nearly so. Antioquia, 1869.

XANTHOXYLUM. *See* **Zanthoxylum.**

XENIATRUM. A synonym of **Clintonia** (which *see*).

XENOCARPUS. A synonym of **Cineraria** (which *see*).

XENOPHONTA. A synonym of **Barnadesia** (which *see*).

XERANDRA. A synonym of **Iresine** (which *see*).

XERANTHEMUM (from *xeros*, dry, and *anthemon*, a blossom; alluding to the dry nature of the flowers, which retain their form and colour for years). Immortelle. SYN. *Harrisonia* (of Necker). ORD. *Compositæ.* A small genus (four or five species) of hardy, erect, branched, hoary, annual herbs, inhabiting the Mediterranean region and the Orient. Flower-heads solitary, long-pedunculate at the tips of the branches, heterogamous, disk-formed; involucre campanulate or oblong-cylindrical; bracts in several series, imbricated, the inner ones pink or whitish (rarely blue?); receptacle flat, with rigid pales; limb of the florets bilabiate. Leaves alternate, narrow, entire. The two best-known species are here described. Seeds only require sowing on a light, rich soil. Several plants formerly included here will now be found under **Helichrysum, Helipterum,** and **Phænocoma.**

X. annuum (annual).* *fl.-heads* purple; involucre hemispherical, highly glabrous, the inner bracts much longer, diverging-radiate; florets more than 100. July. *l.* linear or oblong, with revolute margins. *h.* 2ft. South Europe, 1570. (J. F. A. 388.)

X. erectum (erect). A synonym of *X. inapertum.*

X. inapertum (not open). *fl.-heads* white; involucre ovoid-oblong, highly glabrous, the inner bracts a trifle longer, scarcely radiating; florets thirty to forty. June. *l.* linear or oblong, with revolute margins. *h.* 2ft. South Europe and Persia, 1836. SYN. *X. erectum.*

XERONEMA (from *xeros*, dry, and *nema*, a thread; the filaments dry and persist). SYN. *Scleronema.* ORD. *Liliaceæ.* A monotypic genus. The species is an interesting and elegant, stove perennial, with a very short rhizome and fascicled root-fibres. It thrives in a compost of rich, sandy loam and leaf mould. Propagation may be effected by seeds, or by division of the rootstock.

X. Moorei (Moore's). *fl.* clustered, erect, shortly pedicellate; perianth bright crimson, ½in. to ¾in. long, persistent, the segments distinct, linear, erect, sub-equal; stamens six, exserted; raceme terminal, simple, secund, the rachis abruptly inflexed at base, often horizontal. *l.* clustered at the base of the stem, 12in. to 16in. long, erect. Stem erect, simple, about 20in. long, with a few reduced leaves. New Caledonia, 1878. (G. C. n. s., x., p. 17; I. H. 1877, 297.)

XEROPHYLLUM (from *xeros*, dry, and *phyllon*, a leaf; alluding to the dry, Grass-like leaves). ORD. *Liliaceæ.* According to Baker, a monotypic genus. The species is a handsome, hardy, perennial, sub-aquatic herb. It succeeds in a peat border, and will, if treated with care, ripen seeds, by which means, and by division of the roots, the plant may be propagated.

FIG. 235. XEROPHYLLUM ASPHODELOIDES, showing Habit and detached Single Flower.

X. asphodeloides (Asphodel-like).* Turkey's Beard. *fl.*, perianth whitish, six-parted, ¼in. long, the segments spreading, many-nerved at back; stamens six, hypogynous, rather shorter than the perianth; pedicels ascending, solitary, not jointed, 1in. to 1½in. long; raceme dense, 4in. to 6in. long, 2in. to 3in. broad. May. *l.* radical, in a very dense rosette, subulate, persistent, 1ft. to 1½ft. long, one line broad, reclined, rough on the margins, remarkably dry and rigid. Stem 1ft. to 2ft. high, its leaves reduced to bristle-like bracts. Rhizome thick. North America, 1765. See Fig. 235. (G. C. n. s., xiii., p. 433.) SYNS. *X. setifolium* (B. R. 1613), *Helonias asphodeloides* (B. M. 748).

X. a. tenax (tenacious). *fl.* rather larger; stamens equalling or exceeding the perianth. *l.* ⅛in. to ¼in. broad. 1811.

X. setifolium (bristle-leaved). A synonym of *X. asphodeloides.*

XEROPHYTA. A synonym of **Vellozia** (which *see*).

XEROTES (from *xerotes*, dryness; alluding to the arid herbage). SYN. *Lomandra.* ORD. *Juncaceæ.* A genus comprising thirty species of greenhouse, perennial or rarely annual, rigid herbs, natives of Australia, one species being also found in New Caledonia. Flowers small, the males usually either in dense clusters or solitary along the branches of a panicle, sessile or pedicellate within short, scarious bracts; female inflorescences either similar to the males, or less branched, or reduced to single, sessile, globular heads, or rarely both sexes in dense, globular or oblong heads, along a simple rachis, or connected into a long, dense, cylindrical spike; scapes or peduncles short, or the inflorescence sessile in the tufts of radical leaves or at the ends of the leafy stems,

Xerotes—*continued.*

or more or less elongated below the inflorescence. Stems tufted. Only two species call for description in this work. Both are perennials, thriving in light, rich soil. They may be increased by division of the root.

X. longifolia (long-leaved). Australian Tussock Grass. *fl.* greenish-white; clusters dense, sessile along the rachis at the bases and ends of the branches; whole inflorescence 6in. to nearly 12in. long; scape 1ft. to nearly 2ft. high, much flattened below the panicle. June. *l.* radical or nearly so, 1ft. to 2ft. long, one to three lines broad, flat or concave, with a short, sheathing base, mostly two-toothed at apex. *h.* 3ft. 1798. (B. R. 1839, 3.)

X. rigida (rigid). *fl.* greenish-white, sessile in sessile clusters; inflorescence 1½in. to 2in. long, shortly branched at base; male scapes from some of the lower axils flat and broad, 1½in. to 2in. long. June. *l.* thick and rigid, less than 1ft. long, 2in. to 2½in. wide, spreading, obtuse, truncate, or two-toothed at apex, the short sheaths covering the base of the stem. Leafy stem shortly developed, rather thick, terminating a creeping rhizome. 1791. (L. B. C. 798.)

XIMENESIA. Included under **Verbesina** (which *see*).

XIMENIA (named after Francis Ximenes, a Spanish monk, who wrote a work on Mexican plants in 1615). SYN. *Heymassoli.* ORD. *Olacineæ.* A small genus (four species are known) of stove or greenhouse, glabrous or tomentose trees or shrubs; one is Mexican, another South African, a third inhabits the South Pacific Islands, and the fourth is broadly dispersed through the tropics. Flowers whitish, large for the order, in short, axillary cymes, or rarely solitary; calyx small, four or five-toothed or lobed; petals four or five, hypogynous; stamens eight or ten. Drupes ovoid or globose; flesh pulpy. Leaves alternate, entire, sub-coriaceous, often fascicled. The drupes of *X. americana* have a sweet, aromatic flavour, but are a little rough to the palate. This species thrives in a compost of loam and peat. Cuttings will readily root in sand, under a glass, in heat.

X. americana (American). False Sandalwood; Hog, Mountain, or Seaside Plum. *fl.* odorous, racemose or corymbose; petals four, oblong, villous internally, many times longer than the calyx. April. *fr.* oval or oblong, edible. *l.* 1½in. by 1in. and upwards, glabrous, ovate-oblong or roundish, emarginate, rounded at base. Branches covered with astringent bark, often ending in a spine. *h.* 20ft. Tropics, 1759. Stove tree.

XIPHIDIUM (from *xiphos*, a sword, and *eides*, likeness; alluding to the shape of the leaves). ORD. *Hæmodoraceæ.* A genus consisting of two species (perhaps varieties of one) of stove, perennial herbs, with short rhizomes, natives of tropical America. Flowers rather small, glabrous, shortly pedicellate at the sides of the simple panicle branches, unilateral; perianth tube none, the segments equal, oblong, spreading, not decurrent at base; stamens three, affixed at the base of the inner segments. Leaves rather broadly linear or long-lanceolate, distichous, membranous, equitant. *X. floribundum* thrives in an equal mixture of loam, peat, and sand. It may be readily increased by division of the roots.

X. albidum (whitish). A synonym of *X. floribundum.*

X. floribundum (bundle-flowered). *fl.* white or blue, eight to ten along the branches of the panicle; perianth segments ⅓in. long, oblong-lanceolate, glabrescent; panicle pubescent. May and June. *l.* oblong-lanceolate or oblong, 1in. to 2in. broad, acuminate, often distinctly muricated at the edges, glabrous. *h.* 1ft. to 2ft. West Indies, 1856. (B. M. 5055.) SYN. *X. albidum. X. giganteum* is a very broad-leaved form, with entire margins.

XIPHION. Included under **Iris** (which *see*).

XIPHOPTERIS. Included under *Polypodium.*

XYLOBIUM (from *xylon*, wood, and *bios*, life; in allusion to the substance on which the plants grow). ORD. *Orchideæ.* A genus comprising about sixteen species of stove, epiphytal, tropical American Orchids, closely allied to *Maxillaria.* Flowers racemose, very shortly pedicellate; sepals erect, at length somewhat spreading, the lateral ones broader than the upper one,

Xylobium—*continued.*

adnate at base to the foot of the column, forming a chin; petals similar to the upper sepal, but smaller; lip sub-articulated with the foot of the column, sessile or contracted and incumbent at base, at length erect, the lateral lobes erect, clothing the erect, semi-terete column, the middle one short, broad, spreading; scapes at the bases of the pseudo-bulbs, erect, simple. Leaves ample or elongated, plicate-veined, contracted into the petioles. Stems short, many-sheathed, mostly thickened into a one or two-leaved, fleshy pseudo-bulb. The best-known species are here described. For culture, *see* **Maxillaria** (under which the species were formerly classed).

X. concavum (concave-lipped). *fl.* pale yellow; lateral sepals falcate, acuminate; petals half as large as the sepals; lip almost truncate, concave, bluntly three-lobed, the middle lobe somewhat fleshy and tuberculated at the edge, rose-veined, with a long, narrow ridge in the middle, three-lobed at the point. *l.* twin, three-ribbed, shining, narrowed into the petioles. Pseudo-bulbs oblong, deeply furrowed. *h.* 9in. Guatemala, 1844. SYN. *Maxillaria concava* (L. & P. F. G. ii., p. 53).

X. decolor (discoloured). *fl.*, sepals and petals sulphur-coloured, the former ovate-oblong, obtuse, spreading, the latter half as large, connivent; lip whitish, obsoletely three-lobed, obtuse, hooded, with five elevated, parallel calli; scapes radical, many-flowered. *l.* solitary, oblong-lanceolate, acuminate at both ends, 1ft. to 1½ft. long. Pseudo-bulbs oblong, compressed. *h.* 1ft. Jamaica, 1830. SYN. *Maxillaria decolor* (B. M. 3981; B. R. 1549).

X. elongatum (elongated). *fl.* in a dense, oblong raceme; sepals and petals pale, linear, acuminate; lip purplish-brown, warted, ovate-oblong, very fleshy; scapes erect, two-sheathed. *l.* lanceolate, three-ribbed, about twice as long as the elongated, cylindrical pseudo-bulbs. *h.* 1ft. Central America, 1847. SYN. *Maxillaria elongata* (L. & P. F. G. iii., p. 69.)

X. foveatum (foveate). *fl.* of a pale, uniform straw-colour, faintly scented; sepals and petals linear-oblong; lip three-lobed at apex, the middle lobe rounded, fleshy, excavated. *l.* lanceolate, undulated, thrice as long as the raceme. *h.* 1ft. Demerara, 1839. Allied to *X. squalens.* SYN. *Maxillaria foveata.*

X. pallidiflorum (pale-flowered). *fl.* pedicellate; sepals and petals pale sulphur-coloured, one-ribbed, the lower sepals broadly falcate; lip whitish at back, reflexed above, somewhat truncate-emarginate at apex; racemes erect, three to seven-flowered. *l.* oblong, acuminate, glabrous, 8in. to 10in. long, three-ribbed, arcuate-recurved, attenuated into the petioles. Pseudo-bulbs densely aggregated, cylindrical, 6in. to 7in. long. *h.* 1ft. Venezuela, 1826. SYN. *Maxillaria pallidiflora* (B. M. 2806).

X. squalens (squalid). *fl.* pale, dingy yellowish-flesh-coloured, numerous, in a dense, thyrsiform raceme; two of the petals and the three-lobed lip streaked with purple, the side lobe of the lip deep purple; scape 4in. to 6in. high, brown-scaly. *l.* two to a pseudo-bulb, 8in. to 12in. long, tapering into footstalks, strongly five-ribbed. Pseudo-bulbs several, oblong, dark green, sheathed with brown scales. Brazil, 1828. SYNS. *Maxillaria squalens* (B. M. 2955), *Dendrobium squalens* (B. R. 732).

XYLOMELUM (from *xylon*, wood, and *melon*, an apple; alluding to the woody fruit). ORD. *Proteaceæ.* A small genus (four species) of greenhouse trees or tall shrubs, endemic in Australia. Flowers sessile in pairs within each bract, disposed in opposite, dense spikes; perianth regular, with revolute segments; bracts small. Fruit large, ovoid or tapering above the middle, very thick and woody, tardily opening along the upper side, or in two valves. Leaves opposite, entire or prickly-toothed. The fruits are known in Australia as Wooden Pears. Only one species has been introduced. It thrives in a compost of sandy peat and fibry loam. Ample drainage must be given. Propagated by cuttings of young and rather firm shoots; or by seeds, sown in slight heat.

X. pyriforme (pear-fruited). *fl.*, spikes very dense, 2in. to 3in. long, usually clustered three to six together, at first appearing terminal, but soon becoming lateral. *fr.* 2½in. to 3in. long, above 1in. in diameter near the base, tapering above the middle. *l.* of the flowering branches entire, lanceolate or ovate-lanceolate, very acute, 4in. to 6in. long; those of flowerless branches or young shoots often sinuate and prickly-toothed, attaining 8in. in length. 1869. A moderate-sized tree.

XYLOPHYLLA. Included under **Phyllanthus** (which *see*).

XYLOPIA (abridged from *xylopicron*, which is from *xylon*, wood, and *pikros*, bitter; the wood of some of the species is intensely bitter). Bitter Wood. ORD. *Anonaceæ.* A genus comprising nearly thirty species of

Xylopia—*continued.*

leafy, stove trees or shrubs; five are Indian, six or seven African, and the rest inhabit America. Flowers solitary or fascicled in the axils, sessile or shortly pedicellate; sepals three, more or less connate, valvate; petals six, biseriate, the inner ones included; stamens indefinite. Leaves coriaceous, often distichous. It is doubtful whether the under-mentioned tree is still grown in gardens. A compost of sandy loam and fibry peat, to which is added a small quantity of broken bricks, charcoal, and dried cowdung, is most suitable for its culture. Propagated by cuttings of the hard shoots, inserted in sandy soil, in heat.

X. glabra (smooth). *fl.*, corolla silky; outer petals ½in. to ¾in. long; bracteoles somewhat remote from the calyx, deciduous. *l.* lanceolate, taper-pointed, 2in. to 3in. long, downy beneath, clothed with appressed hairs in the younger state. *h.* 20ft. West Indies, Venezuela, and Guiana, 1820.

XYLOSTEUM. Included under **Lonicera** (which *see*).

XYRIDEÆ. A small natural order of perennial or rarely annual, Rush-like or Sedge-like, tufted herbs, broadly dispersed over the warmer regions of the globe, often growing in watery places. Flowers hermaphrodite, scarcely irregular, in terminal, solitary heads of densely imbricating, rigid, scarious, one-flowered bracts; perianth of six segments in two series, the three outer segments calycine, the three inner petaloid; stamens three to six, inserted on the inner perianth segments, three opposite fertile, the others sterile, penicillate, or obsolete; filaments filiform; anthers two-celled. Capsule one-celled, loculidally three-valved, or three-celled and fenestrate at base, operculate above; scapes erect, simple. Leaves radical, rosulate or clustered, linear or rarely linear-lanceolate, sheathing at base, often equitant. Roots fibrous. The leaves and roots of these plants are used in the cure of itch in India and South America. The order embraces two genera—*Abolboda* and *Xyris*—and less than fifty species.

XYRIS (an old Greek name used by Dioscorides for *Iris fœtidissima*). Yellow-eyed Grass of North America. ORD. *Xyrideæ*. A genus comprising about forty species of stove, greenhouse, or hardy, perennial or rarely annual, Rush-like herbs, broadly dispersed over the warmer regions of the globe. Flower-heads globose, ovoid, or rarely hemispherical or shortly cylindrical; sepals petaloid, very broad, more or less distinctly three-nerved; corolla lobes ovate; staminodes often three. Leaves radical, linear, rigid or Grass-like, tufted or distichous, surrounding the scape. *X. operculata*, the only species worth describing here, thrives in light, rich soil. It may be increased by divisions of the root.

X. operculata (covered). *fl.-heads* ovoid to globular, four to six lines in diameter, the scales black; scapes slender, 1ft. to 1½ft. high, inclosed at base in a rather long sheath without any lamina, in the centre of the tuft of leaves. June. Sheaths shining brown, some of them produced into very narrow, almost subulate leaves, mostly less than 6in. long. Australia, 1804. Stove perennial. (B. M. 1158; L. B. C. 205.)

XYSMALOBIUM (from *xysma*, a fragment, and *lobos*, a division; alluding to the minute divisions of the corona). ORD. *Asclepiadeæ*. A genus consisting of about eight species of stove or greenhouse, perennial herbs, natives of tropical and South Africa. Flowers in umbelliform cymes; calyx five-parted, having five or many glands at the base within; corolla somewhat rotate-campanulate, five-cleft, the lobes reflexed-bearded or naked within; coronal scales five, affixed to the staminal tube. Leaves opposite, broadly lanceolate or linear. *X. padifolium*, the only species known in gardens, requires similar treatment to that recommended for **Gomphocarpus.**

X. padifolium (Cherry-leaved). This is the correct name of the plant described in this work under the name of *Gomphocarpus padifolius.*

YAM. *See* **Dioscorea.**

YANG-MAE-TREE. A common name for **Myrica Nagi** (which *see*).

YARROW. A popular name for **Achillea** (which *see*).

YARROW, SOLDIERS'. A name applied to **Stratiotes aloides** (which *see*).

YATE OR YEIT TREE. A common name for **Eucalyptus cornuta** (which *see*).

YELLOW ARCHANGEL. A name applied to **Lamium Galeobdolon** (which *see*).

YELLOWBY. A common name for **Chrysanthemum segetum** (which *see*).

YELLOW CRESS. A popular name for **Barbarea præcox** (which *see*).

YELLOW ELDER. *See* **Tecoma stans.**

YELLOW EVERLASTING. *See* **Helichrysum arenarium.**

YELLOW-EYED GRASS (of North America). *See* **Xyris.**

YELLOW GARDEN HAWK WEED. *See* **Tolpis barbata.**

YELLOW IRIS. *See* **Iris Pseudo-acorus.**

YELLOW LARKSPUR. *See* **Tropæolum.**

YELLOW RATTLE. *See* **Rhinanthus Cristagalli.**

YELLOW ROCKET. *See* **Barbarea vulgaris.**

YELLOW SLUG (*Limax flavus*). In its habits this Slug differs from the other **Slugs** (which *see*), as it very frequently lives in cellars and other damp places in towns. During the day it lies concealed; but at night it goes in search of its food, and shows itself very partial to cooked articles. Though it prefers potatoes and other vegetables, it will readily eat any kind of meat. The Yellow Slug may also be found in gardens and in woods; and where one occurs, others are seldom far off, as it is gregarious in its habits. It may reach a length of 4in. to 5in., but is usually found of a smaller size. The body is yellowish, spotted with dark brown, and is covered with numerous short, longitudinal ridges. There is a distinct keel on the upper surface of the tail. Other Slugs also are often more or less yellow in colour, but the size, habits, and markings of *L. flavus* will suffice to distinguish it from them. The remedies recommended under **Slugs** are applicable against this species.

YELLOW STAR FLOWER. *See* **Sternbergia lutea.**

YELLOW STAR OF BETHLEHEM. *See* **Gagea lutea.**

YELLOW SULTAN. *See* **Centaurea suaveolens.**

YELLOW UNDERWING. *See* **Tryphæna.**

YELLOW-WEED, DYER'S. *See* **Reseda Luteola.**

YELLOW WOOD. A name applied to *Cladrastis tinctoria*, *Ochrosia borbonica*, several species of *Podocarpus*, &c.

YELLOW-WORT. *See* **Chlora.**

YEVERING BELLS. A common name for **Pyrola secunda** (which *see*).

YEW. *See* **Taxus.**

YEW-BUD GALLS. The buds of the Yew (*Taxus baccata*) are liable to be injured by a Gall Midge, and also by a Gall Mite. The former (*Cecidomyia Taxi*)

Yew-bud Galls—*continued.*

produces a cone-shaped Gall at the tips of the young twigs, composed of crowded, overlapping leaves (see Fig. 236), which remain short, but become broader than the healthy leaves; they are like the latter in colour. The larvæ live between the altered leaves. The Galls are usually of the size figured. They are generally solitary; but two or three may be present at the tip of a twig. The simplest method for preventing harm to the trees from this cause is to pick off the *young* Galls, as this destroys the larvæ.

FIG. 236. MONŒCIOUS BRANCHLET OF YEW (*Taxus baccata*), showing (*g*) Gall of *Cecidomyia Taxi.*

The Gall Mite (*Phytoptus Taxi*) is a much more dangerous foe. It attacks the leaf-buds, and also the male and female flowers, all of which enlarge, and may reach $\frac{1}{5}$in. in diameter, becoming, at the same time, yellow or red. The galled organs are fleshy, and are covered with small, translucent warts. Between them live multitudes of the minute Gall Mites. The Galls remain on the branches all winter, serving for the protection of the Mites. These crawl out the following spring, and produce new Galls in the younger buds. Mr. Andrew Murray was the first to describe these Galls, from examples found by Professor Thistleton Dyer, near London, in 1875. Mr. Murray describes the branches as looking as if frost-bitten. The most effectual—indeed, the only reliable—remedy is to remove the galled branches and burn them, while the Mites are still in the Galls.

YEW-BUD MITE. *See* **Yew-bud Galls.**

YEW, CHINESE. *See* **Podocarpus chinensis.**

YEW, CLUSTER-FLOWERED. *See* **Cephalotaxus.**

YEW GALLS. *See* **Yew-bud Galls.**

YEW, JAPANESE. A common name for **Cephalotaxus pedunculata fastigiata** (which *see*).

YEW, JOINTED. A popular name for **Athrotaxis** (which *see*).

YEW, LORD HARRINGTON'S. *See* **Cephalotaxus pedunculata.**

YEW, PRINCE ALBERT'S. *See* **Saxegothea conspicua.**

YEW, STINKING. *See* **Torreya.**

YOKE ELM. A name applied to **Carpinus Betulus** (which *see*).

YOUTH AND OLD AGE. *See* **Zinnia.**

YOUTHWORT. A common name for **Drosera rotundifolia** (which *see*).

YPONOMEUTA. A form, sometimes used incorrectly, of the name *Hyponomeuta*, a genus of small Moths, whose web-forming larvæ are often destructive to various kinds of garden trees and shrubs. *See* **Hawthorn Caterpillars.**

YUCCA (a native name of the genus). Adam's Needle; Bear's Grass; Spanish Bayonet. ORD. *Liliaceæ.* A genus (comprising, according to Engelmann twelve, according to Baker twenty-one, species) of handsome, stove, greenhouse, or hardy plants, allied to *Dracæna* and *Cordyline;* they inhabit the Southern United States, Mexico, and Central America. Flowers rather large, shortly pedicellate at the sides of the panicle branches, pendulous; perianth segments distinct or scarcely connate near the base, lanceolate-ovate, rather thick, more or less connivent in a globe; stamens six, hypogynous, erect, much shorter than the perianth; filaments rather thick; anthers small, sessile or adnate with the tips of the filaments; panicle terminal, showy, many-flowered, sub-sessile amongst the leaves, or supported on a bracteate peduncle. Fruit sometimes fleshy, pulpy, or nearly spongy, sometimes dry, septicidally or loculidally three-

FIG. 237. POD OF YUCCA.

valved (see Fig. 237). Leaves clustered at the apex of the caudex, linear-lanceolate, thick and rigid or rarely flaccid, usually spinescent at apex, the margins entire or filamentose. Caudex or stem woody, sometimes dwarf, sometimes at length tall and arborescent, branched. All the Yuccas thrive in a rich, light soil, and may be propagated either by divisions, planted in the open ground, or by means of pieces of the thick, fleshy roots, cut into lengths, and inserted in sandy soil, in heat. Seeds of any of the species are rarely, if ever, produced in this country. Many of the plants make noble objects if properly placed and suitably treated. The greenhouse ones may be plunged in their pots, &c., and used for subtropical effects in the open air during the summer months. Except where otherwise indicated, the undermentioned species are hardy.

Most of the descriptions are translated from Mr. Baker's admirable Monograph of *Aloineæ* and *Yuccoideæ*, which appeared in the "Journal of the Linnean Society," vol. xviii.

Yucca—*continued.*

Y. acuminata (taper-pointed), of Sweet. A form of *Y. gloriosa.*

Y. acuminata (taper-pointed), of gardens. A synonym of *Y. flexilis.*

Y. acutifolia (acute-leaved). *fl.* large, pendent, moderately expanded; perianth strongly striated and spotted with dark brown; panicle columnar, about 5ft. high, the flowering branches short and erect. Summer. *l.* sub-erect, stiff, channelled, shortly acuminate, 2½ft. long, bordered by a line of deep red. French gardens, 1869.

Y. agavoides (Agave-like). A garden synonym of *Y. Treculeana.*

Y. albo-spica (white-spiked). A synonym of *Y. constricta.*

Y. aloifolia (Aloe-leaved).* *fl.*, perianth white, 1½in. to 2in. long, the segments oblong or oblong-lanceolate, ½in. to 1in. broad; lower pedicels 1in. to 1½in., upper ones ⅝in. to ¾in., long; panicle rhomboid, dense, 1ft. to 2ft. long, the branches ascending; peduncle very short. May and June. *l.* fifty to 100 rigid, ensiform, 1ft. to 1½ft. long, 1in. to 1½in. broad, green, glaucous-tinged, with a pungent, reddish-brown horn at the tip, the margins whitish, serrulated. Stem slender, sometimes 15ft. to 20ft. high, usually simple. West Indies to North Carolina. Greenhouse. (B. M. 1700; P. M. B. iii. 25.) The following, most of which are often classed as species, are regarded, by Baker, as varieties of *Y. aloifolia*: *Atkinsi* and *purpurea*, dwarf, with purplish leaves; *arcuata*, *crenulata*, and *tenuifolia*, small forms, with narrow, more or less arched leaves; *conspicua*, leaves looser, broader, recurved, 1½in. broad; *Draconis* (G. C. 1870, p. 828), leaves looser, longer, recurved; *quadricolor*, leaves reddish-tinged; *tricolor* (= *lineata-lutea*), a common form in gardens, having leaves variegated with white and yellow; *variegata*, leaves with whitish stripes.

FIG. 238. YUCCA ANGUSTIFOLIA.

FIG. 239. YUCCA ANGUSTIFOLIA STRICTA.

Y. angustifolia (narrow-leaved), of Pursh.* *fl.*, perianth greenish outside, campanulate, the segments oblong, acute, 2in. to 2½in. long, ⅔in. to 1¼in. broad; pedicels ½in. to 1in. long; raceme terminal, thirty to forty-flowered, sometimes simple, often with a few ascending branches at the base, 3ft. to 4ft. long; peduncle nearly 1ft. long. July. *l.* 100 or more, dense,

Yucca—*continued.*

FIG. 240. YUCCA FILAMENTOSA.

rigid, linear, 1½ft. to 2ft. long, three to four lines broad, channelled above, pungent-pointed, the pale reddish-brown margins copiously filamentose. Missouri, &c., 1811. Plant nearly stemless. See Fig. 238. (B. M. 2236.)

Y. a. stricta (straight). *fl.*, inflorescence more compound; peduncle 2ft. to 3ft. long. *l.* ½in. to ¾in. broad, narrowed at base, less rigid, and less pungent-pointed. Arkansas, 1817. See Fig. 239. (B. M. 2222, under name of *Y. stricta.*)

Y. angustifolia (narrow-leaved), of Carrière. A synonym of *Y. constricta.*

Y. angustifolia (narrow-leaved), of gardens. A synonym of *Y. flexilis.*

Y. antwerpensis (Antwerp). A form of *Y. filamentosa.*

Y. arcuata (arcuate). A form of *Y. aloifolia.*

Y. argospatha (white-spathed). *fl.*, perianth pure white, large; pedicels long and slender; bracts satiny-white, undulated; panicle pyramidal. Summer. *l.* numerous, channelled, 2ft. to

Yucca—*continued.*

2½ft. long, having reddish, finely-denticulate margins, and a sharp, brownish-yellow, spiny point. Stem short. Grenoble Botanic Garden, 1869. Allied to, and perhaps a form of, *Y. Treculeana.*

Y. argyrophylla (silvery-leaved). A synonym of *Furcræa Bedinghausii.*

Y. Atkinsi (Atkins'). A form of *Y. aloifolia.*

Y. baccata (berried). *fl.*, perianth white, 2in. to 3in. long, the segments oblong-lanceolate, ½in. to ¾in. broad; bracts large, lanceolate; inflorescence 5ft. to 6ft. long, on an elongated peduncle, the branches 6in. long, often glabrous. Summer. *fr.* purple, ovoid or oblong, baccate, 3in. to 5in. long, edible. *l.* ensiform, thick, very rigid, 1½ft. to 3ft. long, 1in. to 2in. broad, scabrous, slightly concave above, pungent-tipped, the reddish-brown margins copiously filamentose, very squarrose. *h.* 8ft. to

FIG. 241. YUCCA FILAMENTOSA FLACCIDA.

10ft.; or plant stemless. Colorado, 1873. Hardy or half-hardy. (I. H. n. s. 115.)

Y. b. australis (Southern). A synonym of *Y. filifera.*

Yucca—*continued.*

Y. b. circinata (curled-threaded). *l.* 2ft. to 2½ft. long, five to six lines broad, copiously circinate-thready.

Y. b. fragilifolia (fragile-leaved). *l.* weaker than in the type, the outer ones recurved, 1½ft. long, six to seven lines broad, the margins having a few threads above only. Trunk short and slender.

FIG. 242. YUCCA FILAMENTOSA ORCHIOIDES.

Yucca—*continued.*

Y. b. scabrifolia (scabrous-leaved). *l.* rather fragile, the outer ones recurved, 1½ft. to 2ft. long, four to five lines broad, of a pleasing green, paler in the middle, and channelled above, rounded at back, the margins arcuate-filamentose.

Y. Boerhaavii (Boerhaav's). *l.* about 200, linear, straight, the lower ones only recurved, 2 t. or more long, ¼in. to ⅜in. broad,

FIG. 243. YUCCA FILIFERA.

FIG. 244. FRUIT OF YUCCA FILIFERA.

Y. b. periculosa (dangerous). *l.* straight, 2½ft. to 3ft. long, eight to nine lines broad, channelled from base to apex, copiously filamentose in the upper half.

acuminate, much dilated at base, green (young ones slightly glaucescent), scarcely pungent at apex, the margins entire, narrowly bordered with red-brown or paler. Mexico (?), 1870. Greenhouse.

Yucca—*continued.*

Y. canaliculata (channelled). A form of *Y. Treculeana.*

Y. circinata (curled-threaded). A form of *Y. baccata.*

Y. concava (concave), of Haworth. A form of *Y. filamentosa.*

Y. concava (concave), of gardens. A synonym of *Y. Treculeana.*

Y. conspicua (conspicuous). A form of *Y. aloifolia.*

Y. constricta (constricted). *fl.*, perianth white, 2in. long, the segments oblong, acute; pedicels four to six lines long; panicle deltoid, 3ft. to 4ft. long, the branches ascending, 6in. to 9in. long, ten to fifteen-flowered; peduncle elongated. Summer. *l.* 100 to 200, dense, rigid, linear, 1½ft. to 2ft. long, six to eight lines broad, slightly narrowed at base, channelled above, pungent-tipped, the narrow, red-brown margins very filamentose. Stem simple, 3ft. to 5ft. high. Utah to North Mexico, 1862. Half-hardy. SYNS. *Y. albo-spica* (F. d. S. ser. ii., vii., p. 110), *Y. angustifolia*, of Carrière (R. H. ix. 1860, f. 3).

Y. contorta (twisted). A name applied in gardens to both *Y. rupicola* and *Y. Treculeana.*

Y. cornuta (horned). A garden synonym of *Y. Treculeana.*

Y. crenulata (crenulate). A form of *Y. aloifolia.*

Yucca—*continued.*

½in. long; bracts large, scarious; panicle rhomboid, the branches flexuous, ascending, 6in. long; peduncle elongated; inflorescence 4ft. to 8ft. long. June. *l.* thirty to fifty, in a dense rosette, ensiform, 1½ft. to 2ft. long, 1½in. to 2in. broad, rather firm, Reed-like, slightly glaucescent, the whitish margins clothed with thread-like filaments. North America, 1675. Plant stemless or nearly so. See Fig. 240. (B. M. 900; Ref. B. 324; R. H. 1860, p. 214.)

Y. f. antwerpensis (Antwerp). *fl.*, panicle 1ft. to 1½ft. long, the branches four to six, shortly pubescent; inflorescence 2ft. to 3ft. long. *l.* fifteen to twenty, erecto-patent, 1ft. to 1½ft. long, 1in. broad, the marginal threads few and very slender. 1875. (B. M. 6316, under name of *Y. orchioides major.*)

Y. f. aureo-variegata (golden-variegated). *l.* marked with bright yellow, longitudinal bands. 1884. Greenhouse.

Y. f. concava (concave). *l.* 1½ft. long, 3in. to 4in. broad, erect-incurved, concave on the face. 1810.

Y. f. flaccida (flaccid).* *fl.*, perianth segments broad; panicle branches pubescent. *l.* slenderer and weaker than in the type, much recurved, the marginal fibres stronger. 1816. See Fig. 241. SYN. *Y. flaccida* (B. R. 1895; Ref. B. 323; R. H. 1859, p. 556).

FIG. 245. FLOWER OF YUCCA FLEXILIS (natural size).

Y. Desmetiana (De Smet's). *l.* 100 to 200, rather loosely disposed, linear, nearly 1ft. long, ½in. to ¾in. broad, all recurved, the young ones purple, glaucous, the old ones green, not pungent at apex, with narrow, pale, serrulated margins, dilated at base. Mexico, 1868. Greenhouse.

Y. Draconis (dragon's). A form of *Y. aloifolia.*

Y. Ellacombei (Ellacombe's). A form of *Y. gloriosa.*

Y. ensifolia (sword-leaved). A form of *Y. flexilis.*

Y. exigua (dwarf). *fl.*, perianth white, tinged with green outside, the segments oblong, acute, 1½in. long; bracts large, lanceolate; pedicels very short; panicle loose, 3ft. long, the branches pubescent, ascending, 6in. long; peduncle elongated, furnished with much-reduced, lanceolate leaves. Summer. *l.* thirty to forty, ensiform, 1½ft. long, 1in. to 1½in. broad, similar to those of *Y. gloriosa*, the margins brown, entire. Western North America, 1873. Plant stemless. (Ref. B. 314.)

Y. falcata (sickle-leaved). A form of *Y. flexilis.*

Y. filamentosa (thready). Silk Grass. *fl.*, perianth white, tinged with green outside, 1½in. to 2in. long, the segments oblong or oblong-lanceolate, ½in. to ¾in. broad; pedicels drooping, ¼in. to

Y. f. glaucescens (glaucescent). *fl.*, perianth segments fifteen to sixteen lines long; panicle and rachis densely clothed with bluish-grey pubescence. *l.* more glaucous than in the type, 1in. broad, the marginal threads rarely slenderer. 1819. SYN. *Y. glaucescens* (S. B. F. G. 53).

Y. f. grandiflora (large-flowered). A synonym of *Y. f. maxima.*

Y. f. major (greater). A synonym of *Y. f. maxima.*

Y. f. maxima (largest). *fl.*, perianth 2½in. to 3in. long, the segments more acuminate than in the type. 1873. (Ref. B. 325.) This is also known as *Y. f. grandiflora* and *Y. f. major.* There is a white-variegated form.

Y. f. orchioides (Orchis-like).* *fl.*, perianth segments ovate, 1in. long; raceme simple, 9in. long; peduncle 1½ft. long. *l.* ten to twelve, 6in. to 9in. long, eight to ten lines broad, scarcely filamentose on the margins. 1861. See Fig. 242. SYN. *Y. orchioides* (R. H. 1861, p. 370).

Y. f. puberula (puberulous). *fl.*, perianth segments oblong-lanceolate, 1¼in. to 1¾in. long; panicle branches pubescent. *l.* weaker and more recurved than in the type. SYN. *Y. puberula* (Ref. B. 322; S. B. F. G. 251).

Yucca—*continued.*

Y. filifera (thread-bearing). *fl.*, inflorescence 6ft. to 8ft. long, on a short peduncle, the branches sometimes 2ft. long. *fr.* fleshy, indistinctly ribbed, pendulous in a young state, erect afterwards. *l.* 1½ft. long, obscure green, lightly channelled, 1in. to 1¼in. broad. Trunk sometimes 50ft. high, 2ft. to 3ft. in diameter. Mexico, 1826. Greenhouse. See Figs. 243 and 244 (R. H. 1876, p. 433.) SYN. *Y. baccata australis* (of Baker).

Y. flaccida (flaccid). A form of *Y. filamentosa.*

Y. flexilis (flexible). *fl.*, perianth white, 3in. long, the segments oblong, acute; pedicels ½in. to ⅔in. long, the bracts small; inflorescence 4ft. long, the central branches 6in. long, six to nine-flowered. Summer. *l.* dense, linear, 2ft. to 2½ft. long, 1in. to 1½in. broad, obscurely plicate, moderately firm, pungent-pointed, the margins horny, red-brown, entire or sometimes obscurely serrulated. Caudex simple, short. Mexico, 1859. Greenhouse. See Fig. 245. (R. H. 1859, p. 400.) SYNS. *Y. acuminata*, *Y. angustifolia*, *Y. longifolia*, *Y. mexicana*, *Y. stenophylla* (all of gardens).

FIG. 246. YUCCA FLEXILIS ENSIFOLIA.

Y. f. ensifolia (sword-leaved).* *fl.*, perianth slightly tinged with red outside, 2in. long; peduncle rather shorter than the leaves. *l.* forty to eighty, nearly erect, pale green (at first slightly glaucescent), 2ft. to 2½ft. long, 1½in. to 1¾in. broad. Stem slender, sometimes 4ft. to 5ft. high. 1870. See Fig. 246. SYN. *Y. ensifolia* (Ref. B. 318).

Y. f. falcata (sickle-shaped). *fl.*, perianth white, slightly tinged with green on the outside, 2in. to 2½in. long; panicle rhomboid, rather loose, 2ft. long; peduncle 1ft. long. *l.* 100 to 150, green, straight, 2ft. long, 1½in. to 1¾in. broad. Plant nearly stemless.

Y. f. nobilis (noble). *l.* sixty to eighty, nearly straight, 1ft. to

Yucca—*continued.*

1½ft. long, 1¼in. to 1½in. broad, concave on the face, the margins horny, pale or red-brown; young ones very glaucescent.

Y. f. semi-cylindrica (half-cylindrical). *l.* forty to fifty, 1¼ft. to 2ft. long, nine to ten lines broad, pale green (at first slightly glaucescent), the outer ones recurved, channelled above from base to apex, the margins red-brown. 1870.

Y. fragilifolia (fragile-leaved). A form of *Y. baccata.*

Y. funifera (cord-bearing). *l.* not numerous, ensiform, 6ft. to 7ft. long, thick, rigid, dingy-green, striolated, the margins furnished with robust, tenacious processes, often 10in. to 12in. long. Mexico, about 1866. Greenhouse. Perhaps a variety of *Y. Treculeana.*

Y. Ghiesbreghtii (Ghiesbreght's). A garden synonym of *Y. guatemalensis.*

Y. gigantea (gigantic). *fl.*, perianth white, 3in. to 3½in. long; panicle 2ft. to 2½ft. long, with twelve to fifteen branches, the central ones nearly 1ft. long, eight to ten-flowered. Summer. *l.* ensiform, straight, spreading, shining-green, 4ft. to 5ft. long, 3in. to 3½in. broad, acuminate, pungent-pointed, the margins whitish; lower ones scarcely recurved. Stem (in gardens) simple, slender, 3ft. to 4ft. high. Mexico (?), 1859. Greenhouse.

Y. glauca (glaucous).* *fl.*, perianth white, broadly campanulate, the segments oblong, 1½in. long; lower pedicels five to six lines long; bracts small, lanceolate; panicle rhomboid, 2ft. to 3ft. long, the branches ascending, glabrous; peduncle 3ft. long. Summer. *l.* twenty-five to thirty, dense, ensiform, 1¼ft. long, 1¼in. to 1½in. broad, the young ones slightly glaucous, somewhat pungent at apex, with very narrow, red-brown, entire or slightly filamentose margins, the outer ones recurved. North America, 1814. Plant stemless, half-hardy. (B. M. 2662; Ref. B. 315.)

Y. glaucescens (glaucescent). A form of *Y. filamentosa.*

Y. gloriosa (glorious).* Mound Lily. *fl.*, perianth tinged with red outside, campanulate, 1½in. to 2½in. long, the segments oblong, acute; pedicels four to twelve lines long; bracts small, lanceo-

FIG. 247. YUCCA GLORIOSA.

Yucca—*continued.*

late; panicle rhomboid, rather dense, 4ft. to 6ft. long, with erecto-patent, glabrous or pubescent branches, the lower ones 1ft. to 1½ft. long; peduncle elongated, furnished with reduced leaves. July. *l.* 100 or more in a dense rosette, 1½ft. to 3ft. long, 2in. to 3in. broad, rigid, erect, obscure-green, slightly glaucescent, somewhat concave on the face and scabrous at back, pungent-pointed, the narrow, red-brown margins entire, or in young forms obscurely serrulated. Stem when old 4ft. to 6ft. high, simple or branched. United States, 1596. See Fig. 247. (B. M. 1260; Ref. B. 320.)

Y. g. acuminata (taper-pointed). *fl.* fewer; perianth 1½in. to 2in. long; panicle smaller. *l.* fifty to sixty, 6in. to 2ft. long, 1½in. to 1¾in. broad, green, straight, acuminate. 1800. Nearly stemless. SYN. *Y. acuminata* (Ref. B. 316; S. B. F. G. 195). *Y. patens* is a similar form, with more numerous, broader, and more glaucescent leaves.

FIG. 248. YUCCA GLORIOSA RECURVIFOLIA.

Y. g. Ellacombei (Ellacombe's). *fl.*, perianth segments acuminate, 2½in. to 3in. long; lower pedicels 1in. to 1½in. long. *l.* forty to fifty, nearly straight, 2ft. to 2½ft. long, 1½in. to 1¾in. broad, concave on the face, at length smooth. Nearly stemless. SYN. *Y. Ellacombei* (Ref. B. 317).

Y. g. medio-striata (middle-striped). *l.* having a broad, whitish-green band down the centre on each side. 1880. (F. d. S. 2393-4.)

Y. g. minor (lesser). *fl.*, perianth 1¼in. long; pedicels short; inflorescence 3ft. to 4ft. long. *l.* straight, 1ft. to 1½ft. long, 1¼in. to 1½in. broad. Dwarfer than the type. (Ref. B. 319.)

Y. g. obliqua (oblique). *l.* glaucous, 1½in. to 2in. broad, oblique, bending. 1808.

Yucca—*continued.*

Y. g. plicata (plaited). *fl.*, perianth 2in. long; panicle large. *l.* slenderer than in the type, but straight, much plaited, 1½ft. to 2½ft. long, 2in. to 2½in. broad, slightly scabrous at back.

Y. g. pruinosa (pruinose). *l.* seventy to eighty, straight, nearly flat in the middle, 2ft. to 2½ft. long, fifteen to sixteen lines broad, glaucescent. Nearly stemless.

Y. g. recurvifolia (recurved-leaved).* *fl.*, perianth segments more narrowed at apex than in the type. *l.* 100 to 150, weaker than in the type, 2ft. to 3ft. long, the outer ones much recurved, less pungent at apex, flat and obscurely plicate in the middle above, concave only just above the base and below the apex; young ones glaucous. Stem short, often branched. 1794. See Figs. 248 and 249. SYNS. *Y. japonica* (of gardens), *Y. pendula* (R. H. 1859, p. 490), *Y. recurva*, *Y. recurvifolia* (Ref. B. 321). The garden form *foliis-variegatis* has a pale greenish-red stripe down the centre. 1883. (I. H. 1883, 475.)

Y. g. rufocincta (reddish-girdled). *l.* slightly recurved, sub-glaucescent, 2in. broad, smooth on both sides, with clearly-defined, reddish-brown margins. 1816. Nearly stemless.

FIG. 249. YOUNG PLANT DEVELOPED FROM ROOT CUTTING OF YUCCA GLORIOSA RECURVIFOLIA.

Y. g. superba (superb). *fl.* larger than in the type; panicle branches much spreading. *l.* broad and straight. Trunk at length 10ft. high. (A. B. R. 473, under name of *Y. gloriosa*.)

Y. g. tortulata (slightly-twisted). *l.* about forty, straight, glaucescent, 1½in. to 1¾in. long, fourteen to fifteen lines broad, often oblique, flexuous. 1873. Stemless.

Y. guatemalensis (Guatemala). *fl.*, perianth white, 2½in. to 3in. long, the segments oblong-lanceolate, acute, ¾in. to 1in. broad, the outer ones broader; pedicels ⅜in. to 1½in. long; bracts white, scarious; panicle dense, rhomboid, 2ft. to 3ft. long, the central branches 6in. long; peduncle very short. Summer. *l.* fifty or more, loosely disposed, ensiform, 2ft. to 3ft. long, 2in. to 3in. broad, shining-green, scarcely pungent at apex, the whitish margins obscurely serrulated; upper ones ascending, much

Yucca—*continued.*

recurved. Stems sometimes 15ft. to 20ft. high, usually simple and tuberous at base. Mexico and Guatemala, 1873. Habit of *Y. aloifolia.* (Ref. B. 313.) SYNS. *Y. Ghiesbreghtii* and *Y. Roezlii* (of gardens).

Y. japonica (Japanese). A garden synonym of *Y. gloriosa recurvifolia.*

Y. lævigata (smooth). A garden synonym of *Y. Peacockii*

Y. lineata-lutea (yellow-lined). A form of *Y. aloifolia.*

Y. longifolia (long-leaved). A synonym of *Y. flexilis.*

Y. lutescens (yellowish). A synonym of *Y. rupicola.*

Y. macrocarpa (large-fruited). *fl.*, panicle sub-sessile, with lanceolate, white, fleshy bracts. *fr.* pale yellowish, cylindrical, obtuse, not marked by any ridges, pulpy, 4in. to 6in. long, 6in. to 7in. in circumference, of a pleasant, sweetish, acidulous taste. *l.* spreading, sharp-pointed, concave, with entire margins. Trunk 1ft. to 4ft. high. Santa Rita Mountains, Arizona. This species is closely allied to *Y. baccata.*

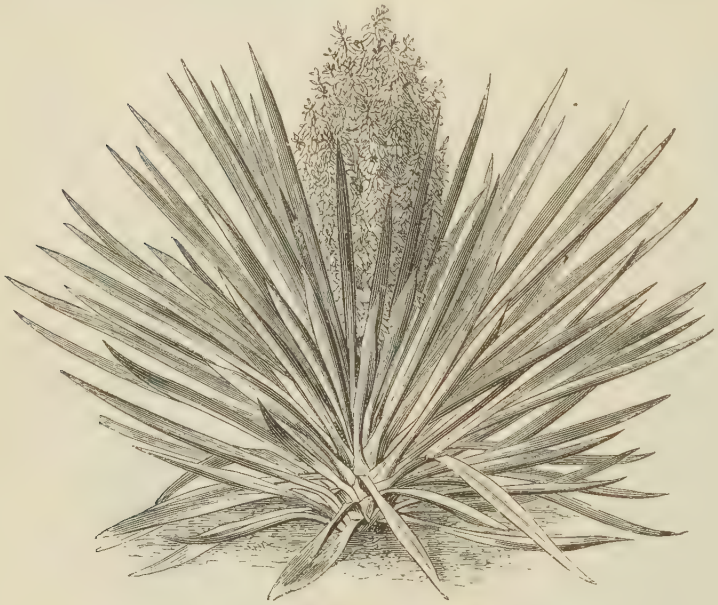

FIG. 250. YUCCA TRECULEANA.

Y. mexicana (Mexican). A synonym of *Y. flexilis.*

Y. nobilis (noble). A form of *Y. flexilis.*

Y. obliqua (oblique). A form of *Y. gloriosa.*

Y. orchioides (Orchis-like). A form of *Y. filamentosa.*

Y. o. major (greater). A synonym of *Y. filamentosa antwerpensis.*

Y. Parmentieri (Parmentier's). A synonym of *Furcræa Bedinghausii.*

Y. patens (spreading). A form of *Y. gloriosa.*

Y. Peacockii (Peacock's). *l.* about 100 (forming a dense rosette 3ft. in diameter), straight, linear, 1½in. to 1½in. long, 1in. broad, obscure-green, smooth and channelled on the face, rounded and slightly scabrous at back, pungent-pointed, the margins entire, reddish-brown. Mexico (?), 1879. Greenhouse. SYN. *Y. lævigata* (of gardens).

Y. pendula (pendulous). A synonym of *Y. gloriosa recurvifolia.*

Y. periculosa (dangerous). A form of *Y. baccata.*

Y. polyphylla (many-leaved). A synonym of *Y. constricta.*

Y. pruinosa (pruinose). A form of *Y. gloriosa.*

Y. puberula (puberulous). A form of *Y. filamentosa.*

Y. purpurea (purple). A form of *Y. aloifolia.*

Y. quadricolor (four-coloured). A form of *Y. aloifolia.*

Y. recurva (recurved). A synonym of *Y. gloriosa recurvifolia.*

Y. recurvifolia (recurved-leaved). A form of *Y. gloriosa.*

Y. revoluta (revolute). A garden synonym of *Y. Treculeana.*

Y. Roëzlii (Roëzl's). A garden synonym of *Y. guatemalensis.*

Y. rufocincta (red-girdled). A form of *Y. gloriosa.*

Yucca—*continued.*

Y. rupicola (rock-loving). *fl.*, perianth white, slightly greenish externally, 2in. to 3in. long, the segments oblong, acute, nine to fourteen lines broad; pedicels ½in. to ¾in. long; bracts small, lanceolate; panicle loose, with ascending branches, the lower ones 6in. long; peduncle 3ft. long, furnished with reduced leaves. Summer. *l.* dense, ensiform, 1½ft. to 2ft. long, ¾in. to 1½in. broad, often twisted, pungent-pointed, smooth above, slightly scabrous at back, with pale, serrulated margins. Texas. Plant stemless. SYNS. *Y. contorta* and *Y. tortilis* (of gardens), *Y. lutescens.*

Y. scabrifolia (scabrid-leaved). A form of *Y. baccata.*

Y. semi-cylindrica (half-cylindrical). A form of *Y. flexilis.*

Y. stenophylla (narrow-leaved). A synonym of *Y. flexilis.*

Y. stricta (straight). A form of *Y. angustifolia.*

Y. superba (superb). A form of *Y. gloriosa.*

Y. tenuifolia (slender-leaved). A form of *Y. aloifolia.*

Y. Toneliana (Tonel's). A synonym of *Furcræa Bedinghausii.*

Y. tortilis (twisted). A garden synonym of *Y. rupicola.*

Y. tortulata (slightly-twisted). A form of *Y. gloriosa.*

Y. Treculeana (Trécul's).* *fl.*, perianth white, campanulate, 1½in. to 2½in. long, the segments oblong, acute, five to six lines broad; lower pedicels 1½in. to 1½in. long; bracts white, as long as the pedicels; panicle dense, 2ft. to 4ft. long, the glabrous branches often 1ft. long; peduncle short. Summer. *l.* dense, ensiform, 2ft. to 4½ft. long, 2in. to 3½in. broad, coriaceous, dull green, scabrous, deeply concave on the face, rounded at back, pungent-pointed, the red-brown margins paler outside, at first obscurely serrulated; adults sometimes slightly filamentose. Stem 20ft. to 25ft. high, 1ft. to 2ft. in diameter, copiously branched. Texas and North Mexico, 1858. Greenhouse. See Fig. 250. (R. H. 1869, p. 406). SYNS. *Y. agavoides, Y. concava, Y. contorta, Y. cornuta, Y. revoluta, Y. undulata* (all of gardens). *Y. canaliculata* (B. M. 5201) is a form having small flowers, and deeply-channelled leaves about 2ft. long. 1858.

Y. tricolor (three-coloured). A form of *Y. aloifolia.*

Y. undulata (wavy). A garden synonym of *Y. Treculeana.*

Y. variegata (variegated). A form of *Y. aloifolia.*

Y. Whipplei (Whipple's). *fl.*, perianth white, tinged with green externally, the segments lanceolate, three to six lines broad; pedicels ascending, 1in. to 1½in. long; bracts white, minute; panicle dense, oblong-lanceolate, the slender branches 6in. long; peduncle elongated, with many reduced leaves; inflorescence 4ft. to 12ft. long. Summer. *l.* 150 to 200, dense, rigid, straight, linear, 1ft. to 1½ft. long, four to six lines broad, green, glaucous-tinged, dilated at base, flat above, channelled at back, sub-triquetrous, pungent-pointed, the pale margins minutely serrulated. California and Arizona, 1876. Plant stemless or nearly so, stoloniferous, half-hardy. (G. C. n. s., vi., p. 197.)

Y. W. violacea (violet).* A striking variety, with violet-tinted flowers. 1884. (R. H. 1884, p. 324.)

YULAN. *See* **Magnolia conspicua.**

ZACINTHA (so called from having been first discovered in the island of Zante, the ancient Zacinthus). ORD. *Compositæ.* A monotypic genus. The species is a glabrous, divaricately-branched, hardy, annual herb, of simple culture.

Z. verrucosa (warted). *fl.-heads* yellow, rather small; involucre narrow, the inner bracts folded, the outer ones spreading; receptacle flat, naked; florets all ligulate, truncately five-toothed at apex; achenes glabrous. Summer. *l.*, radical ones lyrate; cauline ones few, alternate, amplexicaul, more entire. *h.* 6in. to 12in. Mediterranean region. (S. F. G. 820.)

ZACINTHA (of Vellozo). A synonym of **Clavija** (which *see*).

ZALACCA (said to be the name of this genus in the Moluccas). Sometimes spelt *Salacca*. ORD. *Palmæ*. A genus comprising about eight species of stemless, stove Palms, with soboliferous roots; one is a native of Assam, and the rest inhabit the Malayan Archipelago. Flowers often pink, polygamo-monœcious or dicœcious; spathes persistent, the lower ones sheathing the peduncle and branches, incomplete, the partial ones subtending the floriferous branchlets; spadices simple or fastigiately branched, pendulous, the floriferous branchlets catkin-like, rather short, remote or clustered, sessile or pedunculate; bracteoles connate in a two-celled cup. Fruit globose, turbinate, or ovoid, one to three-seeded, usually beaked. Leaves elongated, equally pinnatisect; segments alternate, fastigiate or equidistant, lanceolate or oblanceolate, straight or falcate, acuminate; rachis obtusely triangular, not produced into a spine; petioles slightly terete, armed with often spirally-disposed prickles. The best-known species are here described. The plants grown in some nurseries under the names of *Z. nitida* and *Z. Wagneri* perhaps represent distinct species, but so little is known about them that they cannot be described. The cultural directions given under **Cycas** are applicable to this genus.

Z. Blumeana (Blume's). A synonym of *Z. edulis*.

Z. edulis (edible). *fl.*, spadices drooping, long-branched, the males axillary, longer and more branched than the females; female catkins 2in. to 3in. long, thicker than the males. *fr.* fulvous-fuscescent, pyriform, ⅔in. long. *l.* copious, clustered, erect, clothed with long, often serrate prickles; pinnæ linear-lanceolate, very long-acuminate, 1½ft. to 2¼ft. long, 1½in. to 2in. broad, whitish beneath; petiole rather shorter than the rachis, and armed with robust prickles. Malay Archipelago, 1847. SYN. *Z. Blumeana*.

Z. Wallichiana (Wallich's). *fl.*, spadix axillary, many feet long, drooping or pendulous, long-branched; male catkins 1in. to 2in. long, the female ones cylindrical, 2in. long. *fr.* ovate-pyriform, 1½in. long, slightly acute. *l.* 18ft. to 20ft. long, clustered, nearly erect; pinnæ fascicled in twos, threes, or fours, narrow-lanceolate, with a long and slender, cuspidate point, attenuated and reduplicate at base, flat, the older ones 1½ft. long, 3in. to 4in. broad; petiole 4ft. to 6ft. long, armed with robust, fuscous prickles. India, &c., 1847. (G. C. 1873, p. 1803.)

ZALUZANIA (named after Adam Zaluziansky à Zaluzian, a physician of Prague, who published "Methodus Herbariæ" in 1602). Including *Chiliophyllum* and *Ferdinanda* (in part). ORD. *Compositæ*. A genus embracing seven species of stove, greenhouse or half-hardy, Mexican shrubs or under-shrubs. Flower-heads yellow (or white), heterogamous, radiate, sometimes rather small, in leafy, corymbose panicles. *Ferdinanda eminens* is a tall, stove shrub. Flower-heads white, small, disposed in an ample panicle; involucre short, the narrow bracts in two or three series. Leaves opposite, petiolate, large, angular-lobed. *Podachænium paniculatum* is now the correct name of this plant. It thrives in a compost of loam and peat, and may be increased by cuttings, inserted in sand, under a glass, in heat.

ZALUZIANSKIA (named in honour of the same person as the preceding genus). SYN. *Nycterinia*. ORD. *Scrophularineæ*. A genus comprising about sixteen species of more or less viscous, greenhouse or half-hardy, South African, annual or perennial herbs or sub-shrubs. Flowers sessile, spicate; calyx shortly five-toothed, bilabiate or two-parted; corolla persistent, at length cleft to the base, the limb of five spreading, entire or bifid lobes; stamens often four. Lower leaves alternate; upper ones opposite, few-toothed; floral ones bract-like, entire. Three species have been introduced. All thrive in a mixture of sandy loam and peat. Seeds of *S. capensis* and *S. selaginoides* may be sown, in summer, in the open border. *S. lychnidea* may be increased by cuttings, or by divisions.

Z. capensis (Cape).* *fl.* whitish; corolla slender, nearly 1½in. long; spikes usually short and few-flowered, the central one usually acquiring a considerable length. Spring. *l.*, upper ones

Zaluzianskia—*continued.*

or all linear, few-toothed or quite entire, one-nerved, the margins and nerve usually ciliated. Stem erect, adpressedly villous. *h.* 6in. to 12in. Half-hardy annual. See Figs. 251 and 252.

FIG. 251. ZALUZIANSKIA CAPENSIS.

Z. lychnidea (Lychnis-like). *fl.* yellowish-white; corolla tube 1½in. or rather more in length; spikes elongated. May to July. *l.* oblong-linear, few-toothed or entire, one-nerved, nearly glabrous; floral ones amplexicaul, broadly lanceolate or oblong, obtuse, few-toothed or entire, the margins and nerve ciliated. Branches adpressedly villous. *h.* 6in. to 12in. 1776. Greenhouse sub-shrub. SYNS. *Erinus lychnidea* (B. M. 2504; B. R. 748), *Nycterinia lychnidea* (S. B. F. G. ser. ii. 239).

FIG. 252. ZALUZIANSKIA CAPENSIS, showing detached Flower, Leaf, and Corolla laid open to exhibit insertion of Stamens.

Z. selaginoides (Selago-like). *fl.* white, with an orange centre, fragrant at night; corolla nine to eleven lines long, the throat crowned with rigid pili; spikes interrupted at base. May. *l.* spathulate; lower ones obovate, on rather long petioles; upper ones oblong- or linear-spathulate; floral ones adnate to the calyx, dilated at base. *h.* 3in. to 5in. 1854. Half-hardy annual.

ZAMIA (from *zamia*, loss; a name given by Pliny to barren Pine cones, and hence applied by Linnæus to this genus, in allusion to the sterile appearance of the male fructification). ORD. *Cycadaceæ*. A genus comprising about thirty species of handsome, stove or greenhouse, perennial plants, resembling Palms and, in some particulars, Ferns; they are all natives of tropical America and the West Indies, one only extending up to the Southern

Zamia—*continued.*

United States. Leaves few, appearing one after another, pinnate; pinnæ broad or narrow, entire or serrated; petioles smooth or spinulose. Cones glabrous or rarely furfuraceous, solitary or two or more together; males oblong-cylindrical, with many series of superposed, peltate scales, on thick footstalks; females similar, but larger and thicker. Caudex (sometimes a dwarf trunk) simple, lobed, or branched, smooth or scarred, naked, epigæous or nearly hypogæous. The species best known to cultivation are here described. They thrive in a mixture of equal parts of good loam and peat, with a little silver sand added, and prefer a position where they would be shaded from bright sunshine in summer, and a temperature not lower than 60deg. in winter. In summer, they should be freely watered, both at the root and overhead. When sick, it is a good plan to shake all the soil away from their roots, wash them carefully, cut away all decayed parts, and repot them in fresh soil. They should then be plunged in bottom heat, and watered carefully till new growth appears. Propagated by division in the cases where the stems are clustered; by seeds and offsets where division is not possible. Except *Z. integrifolia*, the North American species, all are stove plants.

Z. amplifolia (ample-leaved).* *l.* erect; leaflets two pairs, broadly ovate-lanceolate, acuminate, glabrous, yellowish-green, 11in. long, 3in. to 4in. broad, strongly ribbed on both sides; rachis angular; petioles 15in. to 16in. long, purplish, terete, puberulous, with scattered, minute prickles. Caudex oblong, obtuse, glabrous. Columbia, 1879. A handsome plant, probably now lost to cultivation.

Z. angustifolia (narrow-leaved). *l.*, adults glabrous; leaflets four to twenty on both sides, mostly alternate, narrow-linear, rather obtuse, 6in. to 8in. long, scarcely narrowed at base; petioles terete beneath, unarmed. *cones* 2in. to 2½in. long; males reddish-tomentose, cylindrical; females thicker, obtusely cuspidate; peduncles erect, rufous-pubescent. Caudex ovoid-conical. West Indies.

Z. calocoma (beautiful-haired).* *l.* 3ft. long, very slenderly pubescent; leaflets eighty on each side, alternate and opposite, the larger ones 4in. long, long-linear, acuminate, slightly narrowed at base, parallel-nerved, the margins revolute; petioles 4in. long, terete beneath. Trunk dwarf. Antilles. *Microcycas calocoma* is now the correct name of this species.

Z. Chigua (Chigua). *l.* 4ft. long; leaflets alternate, very numerous, spreading, long-lanceolate, acuminate, obsoletely denticulate, glabrous, about sixteen-nerved; petioles thickly, and rachis sparsely, prickly. *cones*, males cylindrical, 5½in. to 7½in. long, cuspidate; females much larger, cuspidate. Trunk cylindrical, 8in. high. Darien, 1847. SYNS. *Z. Lindleyi*, *Z. princeps*, *Aulacophyllum Ortgiesi.*

Z. Fischeri (Fischer's). *l.*, leaflets three to six on each side, 1½in. to 2½in. long, about ½in. broad, the lower ones alternate, the upper ones opposite, lanceolate, acuminate, attenuated at base, slightly inequilateral, the upper margin argutely serrulated one-third to half its length; rachis 1½in. to 2½in. long, glabrous or nearly so, produced above the leaflets in a mucro; petioles nearly terete, 2in. or more long. Central America, 1849. (G. C. n. s., xix., p. 213.)

Z. Fraseri (Fraser's). A garden synonym of *Macrozamia Fraseri.*

Z. furfuracea (scurfy).* Jamaica Sago-tree. *l.*, leaflets ten to thirteen on each side, opposite or alternate, obovate-oblong or obversely lanceolate, spinulose-serrulated from the middle to the apex, serrated and sometimes unequally repand-lobed at the extremity, acute or obtuse, below densely, above and on the rachis and petioles slightly, scurfy; rachis almost unarmed; petioles prickly. *cones*, females yellow-scurfy, 2in. to 4in. long, ovoid-elongated. Trunk cylindrical. Mexico, 1691. (B. M. 1969; R. G. 932.)

Z. Ghellinckii (Ghellinck's). A synonym of *Encephalartos Ghellinckii.*

Z. integrifolia (entire-leafleted). Jamaica Sago-tree. *l.* spreading, glabrous; leaflets seven to sixteen on each side, alternate, rarely opposite, the larger ones 4in. to 7in. long, oblong or obovate-oblong, entire or obtusely serrulated at apex; petioles unarmed. *cones* slightly rufous-tomentose; males 2½in. long; females 3½in. long. Trunk short, globular or oblong. Southern United States, &c., 1758. Greenhouse. (B. M. 1851.)

Z. Kickxii (Kickx's). *l.* glabrous; leaflets about twenty-four on each side, alternate or sub-opposite, nearly all spreading, the lower ones smaller, the middle ones 2in. long, ½in. broad, lanceolate-elliptic, the margins, especially the lower one, serrulated; rachis sub-terete; petioles slender, unarmed. *cones*, males cylindrical, elongated, acute, 2in. long. Cuba.

Zamia—*continued.*

Z. Leiboldii (Leibold's). *l.*, leaflets fourteen to twenty-two on each side, truncate or acute at apex, opposite or alternate, twenty to twenty-five nerved; petioles semi-terete. Trunk 8in. high. Mexico, 1843. (R. G. 929, under name of *Z. L. angustifolia.*)

Z. Lindeni (Linden's). *l.* lanceolate, 6ft. long, on elongated petioles; leaflets forty to forty-four on each side, sessile, glabrous, 8in. long, elongated-lanceolate, somewhat falcate, dentate-serrated in the upper half. Trunk cylindrical, 3ft. or more high. Ecuador, 1875. A stately plant. (I. H. 1875, 195.)

Z. Lindleyi (Lindley's). A synonym of *Z. Chigua.*

Z. Loddigesii (Loddiges'). *l.*, leaflets erecto-accumbent, long-lanceolate or linear-lanceolate, slightly narrowed at base, acuminate at apex, 7½in. long, slightly thickened on the margins, serrated from the middle (or nearly so) to the apex; rachis slightly spiny. Caraccas, 1844. (R. G. 926.)

Z. media (medium). A synonym of *Z. pumila.*

Z. Miquelii (Miquel's). A garden name for *Macrozamia Fraseri.*

Z. montana (mountain-loving). *l.* 4ft. to 5ft. long, forming a terminal tuft; leaflets eight to ten pairs, 1ft. or more long, 2in. to 4in. broad, oblanceolate to linear-oblanceolate, abruptly acuminate, with one prominent tooth and a few obscure ones; petioles dusky-tomentose at base, beset throughout with scattered prickles. Trunk 4ft. to 5ft. high, 9in. thick. Columbia, 1882.

Z. muricata (rough). *l.*, leaflets six to eleven pairs, alternate and sub-opposite, oblong or obversely oblong or oblong-lanceolate, acuminate, obscurely spiny-serrulated from the middle to the apex; petioles terete, prickly. *cones* 3½in. to 4in. long, cylindrical, sub-acute at apex; peduncles glabrous. Trunk glabrous. Central America, 1849.

Z. obliqua (oblique). *l.* unarmed, glabrous or covered with a close pubescence; leaflets seven to ten on both sides, ovate-lanceolate, obtusely acuminate at apex, attenuated at base, about 8in. long and nearly 3in. broad. Trunk slender, attaining a height of 6ft. to 7ft. Columbia, 1878. (G. C. n. s., xvii., p. 461; I. H. 1877, 289.)

Z. Ottonis (Otto's). *l.* glabrous, 1ft. to 2ft. long; leaflets nine to fourteen pairs, alternate and (the upper ones) opposite, oblong- or obovate-lanceolate, obtuse, the larger ones 1½in. to 2in. long, argutely serrulated towards the apex, especially on the lower margin; petioles unarmed. *cones* 1½in. long; males fuscous-pubescent, cylindrical; females thick, cuspidate; peduncles 1½in. long, clothed with fuscous and white pubescence. Caudex tuberous, fusiform, 2½in. long. Cuba.

Z. picta (painted).* *l.*, leaflets spotted with white; petioles thicker and more pubescent than in *Z. muricata*, of which *Z. picta* was long considered a variety; it is, however, a much handsomer plant, very distinct from that species. Mexico.

Z. prasina (grass-green). *l.*, leaflets sixteen or seventeen pairs, oblanceolate-cuneate, denticulated towards the apex, bright grass-green above; petioles terete, slightly furrowed in front, and beset with a few white prickles. Honduras, 1881.

Z. princeps (princely). A synonym of *Z. Chigua.*

Z. pumila (dwarf). *l.*, leaflets eighteen to twenty on both sides, obovate-oblong, obtuse, entire or obsoletely serrulated, 2in. to 2¾in. long; petioles unarmed, scurfy-pubescent. *cones* 1½in. to 3½in. long, ellipsoid, obtuse. Florida and West Indies, 1812. Stove or greenhouse. (B. M. 2006.) SYN. *Z. media* (B. M. 1838).

Z. pygmæa (pigmy). *l.* 5in. to 8½in. long; leaflets three to ten pairs, opposite and alternate, obliquely sub-cuneate at base, oval-oblong or oval, the larger ones 1¼in. long, serrated to the middle; petioles terete, unarmed, 2¾in. long. *cones*, males 1in. long, somewhat ovoid-globose, on long peduncles. Caudex growing underground. West Indies. Plant dwarf, highly glabrous. (B. M. 1741.)

Z. Roëzlii (Roëzl's). *l.* 6½ft. long, forming an elegant crown; leaflets 12in. to 16in. long, linear, acute, falcate, glabrous, shining, longitudinally furrowed. *cones*, females large, cylindrical, obtuse. Trunk thick. New Grenada, 1873. (I. H. 1873, 133-4.)

Z. Skinneri (Skinner's). *l.*, leaflets usually four pairs, opposite or alternate, oblong, acute at both ends, coriaceous, shining, spiny-serrulated from the middle to the apex, the larger ones 1ft. long, 3½in. broad; rachis and petioles prickly. *cones*, males three or four, aggregated, elongated-cylindrical, shortly pedunculate, 6in. long, ferruginous-pubescent. Central America, 1851. (B. M. 5242; F. d. S. 2212.) SYN. *Aulacophyllum Skinneri.*

Z. tonkinensis (Tonkin). *l.* pinnatifid, slightly recurved, glabrous, of a beautiful green; leaflets sessile, lanceolate, acuminate at apex, the margins undulated; petioles cylindrical, woolly, furnished with very robust spines. Trunk slender, cylindrical, erect, wholly clothed with large, round, fuscous scales. Tonkin. (I. H. 1885, 547.)

Z. villosus (villous). A synonym of *Encephalartos villosus.*

Z. Wallisii (Wallis').* *l.* solitary, pinnate; leaflets few, lanceolate, plaited, 1ft. long; petioles reddish, prickly. Trunk short and fleshy. New Grenada, 1875. This plant is allied to *Z. Skinneri.*

ZAMIOCULCAS (from *Zamia*, a cycadaceous genus, and *Culcasia*, belonging to the Aroids; both of which the present plants are supposed to resemble). Including *Gonatopus*. ORD. *Aroideæ* (*Araceæ*). A small genus (two species) of stove, herbaceous perennials, natives of Eastern tropical Africa. Flowers dense; spathe tube convolute, sub-globose, the lamina lanceolate or boat-shaped, horned at apex; spadix sessile, cylindrical, shorter than the spathe, inappendiculate. Leaves many, on thick petioles, imparipinnate with six to eight pairs of alternate pinnæ, or bipinnate with opposite pinnæ and pinnules; petioles very shortly sheathing at base. These plants thrive in a compost of sandy loam, leaf mould, and small pieces of charcoal, and require a moist atmosphere. Propagation may be effected by division of the root. "Young plants may also be obtained from the leaflets after they have disarticulated from the rachis, as follows: Place some leaflets upon some soil, which must be kept damp; in a few days, the basal ends of the leaflets commence to swell, and each forms, after a short time, a small tuber. The tuber, with the leaf attached, may then be planted in a small pot, but should only be just covered with earth; roots and leaf-buds quickly form, and soon a young plant is established" (N. E. Brown).

Z. Boivini (Boivin's). *fl.*, spathe 6in. long, the lamina dirty yellowish-green inside, lurid yellowish-green externally, darkly nerved and striated; spadix equalling the spathe, the female portion 1in. long, the male 4in. long, yellow, terete. *l.* solitary, radical, erect, 2ft. to 3ft. long, triangular-ovate, triternately pinnate; pinnæ opposite, ovate-lanceolate, acuminate, sessile or shortly petiolulate; petioles as thick as the little finger. Rhizome short, dilated. 1873. (B. M. 6026.) SYN. *Gonatopus Boivini*.

Z. Loddigesii (Loddiges'). *fl.*, spathe green, thick, the lamina about 2in. long; spadix greenish-yellow, 1½in. to 2in. long, constricted in the middle; scape very short, stout. June. *l.*, pinnæ 3in. to 6in. long, alternate, deciduous, obovate or elliptic-lanceolate, shortly petiolulate or sub-sessile; petioles about 2ft. long, terete, clavate at base. Rhizome short, horizontal, giving off large, white, sessile tubers. 1828. (B. M. 5985.) SYN. *Caladium zamiæfolium* (L. B. C. 1408).

ZANNICHELLIA (named after John Jerome Zannichelli, 1662-1729, a Venetian botanist). Horned Pondweed. ORD. *Naiadaceæ*. A small genus (one or several species) of hardy, slender, aquatic, annual herbs, inhabiting temperate and tropical regions. Flowers minute, solitary or in pairs, axillary. Leaves usually opposite, linear, submerged. *Z. palustris* is a British plant; it has no horticultural value.

ZANONA PALM. A common name for **Socratea exorhiza** (which *see*).

ZANTEDESCHIA (of Koch). A synonym of **Schismatoglottis** (which *see*).

ZANTEDESCHIA (of Sprengel). Synonymous with **Homalonema** and **Richardia** (which *see*).

ZANTE WOOD. The wood of *Chloroxylon Swietenia* and *Rhus Cotinus*.

ZANTHORHIZA. A synonym of **Xanthorhiza** (which *see*).

ZANTHOXYLEÆ. A tribe of *Rutaceæ*.

ZANTHOXYLUM (from *xanthos*, yellow, and *xylon*, wood; alluding to the colour of the roots). Sometimes spelt *Xanthoxylon*. Prickly Ash; Toothache-tree. SYN. *Pterota*. Including *Blackburnia* and *Fagara*. ORD. *Rutaceæ*. A genus embracing about eighty species of stove, greenhouse, half-hardy, or hardy shrubs or trees, often armed with stout prickles, inhabiting tropical and sub-tropical regions. Flowers often white or greenish, small, in axillary or terminal, pedunculate, broad or narrow cymes; calyx three to five-cleft, rarely obsolete; petals three to five, rarely wanting; stamens three to five. Fruit of one to

Zanthoxylum—*continued.*

five fleshy carpels, often aromatic or strongly scented. Leaves alternate, trifoliolate or unequally pinnate; leaflets opposite or alternate, entire or crenate, often oblique, dotted. A selection of the introduced species is here given. For culture, *see* **Zizyphus.**

Z. alatum (winged). *fl.* apetalous; panicles loose, sparingly branched. Spring. *l.* 1½in. to 9in. long; leaflets two to six pairs, lanceolate, obtusely acuminate, glabrous beneath; petiole and rachis usually broadly winged. Prickles often vertically flattened on the trunk and branches. India. Half-hardy shrub or small tree.

Z. americanum (American). Common Toothache-tree. *fl.* apetalous, in axillary umbels. March and April. *l.*, leaflets nine or eleven, ovate, obscurely serrated, equal at base; petioles round, and devoid of prickles; stipules replaced by prickles. *h.* 12ft. to 15ft. North America, 1740. Hardy tree.

Z. aromaticum (aromatic). *fl.* greenish-white; panicles terminal and axillary, glabrous, verrucose, 3in. to 5in. in diameter. April. *l.*, leaflets six to twelve-jugal, elliptic or oblong, crenate, with the crenatures broadly truncate, petiolulate, glabrous, glandular beneath. Prickles short, subulate, or wanting. *h.* 20ft. Jamaica, 1824. Stove tree.

Z. Blackburnia (Blackburnia). *fl.* white; petals imbricated; panicles axillary or terminal, loose, shorter than the leaves. May. *l.* pinnate, with a compound petiole of 4in. to 8in.; leaflets three to nine, very obliquely ovate, shortly acuminate, usually 2in. to 3in. long, petiolulate. *h.* 6it. Australia, 1829. Greenhouse shrub or small tree. SYN. *Blackburnia pinnata*.

Z. clava-Herculis (Hercules' Club). Southern Prickly Ash. *fl.* greenish; panicles terminal and axillary, pubescent, 2in. to 4in. in diameter. April. *l.*, leaflets five to ten-jugal, lanceolate-oblong, pointed, quite entire or minutely serrated, sub-sessile, glabrous above, puberulous along the nerves or glabrate beneath. *h.* 20ft. to 50ft. West Indies, 1824. Stove tree.

Z. nitidum (shining). *fl.* greenish-white; racemes axillary, fascicled. May. *l.* imparipinnate, two or three-jugal; leaflets oblong, shining, remotely glandular-crenate, elongated and emarginate at apex, the midrib (as well as the petioles and branches) prickly. *h.* 10ft. China, 1823. Greenhouse shrub. (B. M. 2558.)

Z. piperitum (Pepper-like). Chinese or Japanese Pepper. *fl.* white. September. *l.*, leaflets oblong, unequal at base, crenate; petioles subulate, jointed; prickles stipular. *h.* 10ft. Japan, 1773. Half-hardy shrub. The small, globose, rugose fruits of this species are called Japan Pepper. SYN. *Fagara piperita*.

Z. Pterota (Pterota). Bastard Ironwood. *fl.* greenish, in axillary clusters, single or by pairs; stamens four. August. *l.*, leaflets seven to nine, ½in. to ¾in. long, obovate, crenate above the middle, sessile; petioles winged, jointed. Branches zigzag, armed with short, curved prickles. *h.* 10ft. South Florida, &c., 1768. Half-hardy tree.

Z. spinifex (thorny). *fl.* white, in a short glomerule. July. *l.*, leaflets one to three-jugal, oval or spathulate, emarginate or blunt, quite entire, ¼in. to ½in. long, glabrous, leathery, bituberculed at the base beneath, devoid of pellucid dots; petioles unarmed. Stipular prickles straight. West Indies, 1825. A low, tortuous, leafy, stove shrub. SYN. *Fagara microphylla*.

ZAPANIA. Included under **Lippia** (which *see*).

ZARA. A synonym of **Pistia** (which *see*).

ZARABELLIA (of Necker). A synonym of **Berkheya** (which *see*).

ZAUSCHNERIA (named after H. Zauschner, a German botanist). ORD. *Onagrarieæ*. A monotypic genus. The species is a handsome, small, half-hardy shrub, thriving in any light, but not on heavy soil. It may be multiplied by cuttings, made from young side shoots, in September, inserted in pots of sandy soil, and placed in a frame. If wintered in a cool house or frame, the young plants may be transferred to the open ground in spring, where they will grow and flower profusely the summer and autumn following. Division of old plants in spring, and seeds, are also available methods of increase. The latter should be sown, about March, on a gentle hotbed. In sheltered places and warm situations, this desirable plant proves itself sufficiently hardy to live outside in winter; but it is safer to propagate a young stock annually than to trust too much to its hardiness.

Zauschneria—*continued.*

Z. californica (Californian).* Californian Fuchsia; Humming-bird's Trumpet. *fl.* bright red, in loose spikes terminating the branches, large, erect, spreading, and with small, leafy bracts; calyx coloured, much produced, funnel-shaped, globose-inflated at base, the segments spreading; petals four, obcordate, or rather deeply two-cleft, rather longer than the calyx lobes; stamens eight, slightly exserted. Summer and autumn. *l.* crowded, linear-lanceolate, narrow, entire or denticulate, sessile, canescently pubescent, the lower ones opposite, those of the branches alternate. *h.* 1ft. California and Mexico, 1847. (F. d. S. 404; P. M. B. xv. 195.)

Z. c. latifolia (broad-leaved). *fl.* rather smaller; calyx dull red. *l.* rather broader, and, as well as the branches, villous-canescent. (B. M. 4493.)

ZEA (*Zea* or *Zeia* was the old Greek name for Spelt, or some similar common Cereal, and is found as far back as Homer). SYN. *Mays.* ORD. *Gramineæ.* A monotypic genus. The species is a well-known, tall, half-hardy Grass. Maize, probably, ranks next to Rice in its importance as a food-plant; it is very largely cultivated throughout

FIG. 253. UPPER PORTION OF PLANT OF ZEA MAYS, showing axillary Female and terminal Male Inflorescences; also Longitudinal Section through Seed.

the warmer regions of the globe, and is imported into England in immense quantities. A fine flour, known as Corn Flour and Maizena, is prepared from the grain of *Z. Mays*, and is largely employed in the making of light puddings, custards, &c. Numerous varieties are grown in gardens, most of them sufficiently hardy to endure the open air. They thrive in any fairly good soil, and may be increased by seeds.

Z. Mays (Maize).* Guinea or Turkey Wheat; Indian Corn; Maize; Mealies. *fl.*, spikelets unisexual, monœcious, the males in a terminal panicle, two-flowered, the females in large, axillary spikes, longitudinally many-seriate, one-flowered. June. *fr.*, spikes (known as "cobs") long and thick, sheathed with imbricated pales. *l.* ample, entire, broad, flat. *h.* 3ft. Probably of American origin, 1562. See Fig. 253. (B. M. Pl. 296.) *gracillima* is a variety of very graceful habit.

Zea—*continued.*

FIG. 254. ZEA MAYS VARIEGATA.

Z. M. variegata (variegated).* This differs from the type in its leaves being striped with white. It is an exceedingly ornamental plant. See Fig. 254.

ZEBRA PLANT. A common name for **Calathea zebrina** (which *see*).

ZEBRA WOOD. A common name for **Myrtus fragrans** and **Guettarda speciosa** (which *see*).

ZEBRINA (the leaves are striped in a zebra-like manner). ORD. *Commelinaceæ.* A small genus (two species) of stove or greenhouse, loosely decumbent, pendulous or climbing, branched herbs, natives of Mexico. Flowers rather small, shortly pedicellate; calyx trifid, or bifid with one lobe broader; corolla lobes spreading; stamens six; cymes sessile in a spathe, fascicle-like, few or many-flowered; spathes on terminal peduncles. Leaves ovate-lanceolate. *Z. pendula* forms a good basket plant, and is also useful for covering the earth in very large pots or tubs, or as an edging in suitable places. It thrives in a light, rich soil, and may be very quickly increased by cuttings.

Z. pendula (pendulous).* *fl.*, calyx tube whitish; corolla tube white, the segments rose-purple, ovate, obtuse; inflorescence glomerate. Summer. *l.* 1¾in. long, ¾in. to 1in. broad, sub-sessile, ovate-oblong, acute, scarcely acuminate, or somewhat obtuse, green, striped with white and sparsely pubescent above, purplish and densely pubescent beneath. Stems decumbent, branched, glabrous or pilose on one side. 1849. (R. H. 1855, p. 141.) SYNS. *Cyanotis vittata, Tradescantia tricolor, T. zebrina.* There is also a tricoloured variety, in which the whitish portion of the upper surface of the leaves is suffused with red.

ZEDOARY, ROUND. *See* **Curcuma Zedoaria.**

ZEHNERIA (named in memory of Joseph Zehner, a botanical artist of Vienna). SYN. *Pilogyne.* ORD. *Cucurbitaceæ.* A genus embracing about fifteen species of stove

Zehneria—*continued.*

or greenhouse, prostrate or climbing herbs, with perennial roots; one is found in Norfolk Island, another in Peru, and the rest inhabit tropical and South Africa and Asia. Flowers small, dicœcious, rarely monœcious; males fascicled, racemose, or corymbose, with three, rarely four or five, stamens; females solitary, fascicled, or corymbose, with three rudimentary stamens; calyx minutely five-toothed or five-lobed; corolla rotate, five-parted. Fruit small, baccate, shortly pedunculate. Leaves angularly toothed or lobed, often membranous. Tendrils simple. Only two species have been introduced. For culture, *see* **Gourds.**

Z. hastata (halbert-shaped). *l.* very ornamental, of a firm texture, lively green in colour, the veins being bordered with silvery-white, ovate, sub-orbicular, oblong, or narrow-lanceolate, glabrous or rarely slightly scabrous below, usually acute or acuminate at apex. Java, 1866. A handsome, tuberous-rooted climber. Its proper name is now *Melothria heterophylla.*

Z. suavis (soft). *l.* white-dotted and scabrous above, pilose, shortly hirsute, or scabrous beneath, cordate-ovate, angular or somewhat three to five-lobed, emarginate at base, the margins slightly and remotely denticulate. South Africa. Greenhouse. *Melothria punctata* is now the correct name of this plant.

ZENOBIA (so called after the famous Empress of Palmyra, who lived in the third century). ORD. *Ericaceæ.* A monotypic genus. The species is a hardy, highly glabrous, often glaucescent shrub, with terete branchlets. It thrives in a compost of sandy loam and peat. Propagation may be effected by seeds, or by layers.

Z. speciosa (showy).* *fl.* in umbel-like fascicles from axillary buds, mostly racemose on naked branches of the preceding year; calyx lobes short, triangular; corolla white, five-lobed; pedicels drooping. Summer. *l.* coriaceous, but deciduous, oval or oblong, 1in. to 2in. long, commonly crenulated or sparsely serrulated, reticulate-veined. *h.* 2ft. to 4ft. South United States, 1800. (S. B. F. G. ser. ii. 330.) SYNS. *Andromeda cassinæfolia* (B. M. 970), *A. speciosa* (L. B. C. 551).

Z. s. pulverulenta (powdery).* A white, glaucous form. (G. C. n. s., xx., p. 109; Gn. xxiv., p. 572). SYNS. *Andromeda dealbata* (B. R. 1010); *A. pulverulenta* (B. M. 667).

ZEPHYRANTHES (from *zephyros*, the west wind, and *anthe*, a flower; a fanciful name given by Herbert). Flower of the West Wind; Zephyr Flower. Including *Habranthus* (in part) and *Pyrolirion.* ORD. *Amaryllideæ.* A genus comprising nearly thirty species of pretty, stove, greenhouse, or hardy, bulbous plants, inhabiting the warmer parts of America; one species being found in Western tropical Africa. Flower always solitary in a spathaceous bract, which is entire or bifid at apex and tubular at base, pedicellate or rarely sessile, erect or slightly declinate; perianth pink, white, purplish, or yellowish, sometimes various-coloured in the same species, funnel-shaped, the tube very short or more or less elongated, enlarged above; lobes equal or slightly unequal, erecto-patent above; stamens affixed to the throat, equal, or three rather smaller; scape elongated, fistular. Leaves few, linear or loriform, appearing with or after the flowers. The species best known to gardeners are described below. The plants grow and flower in summer, and rest in winter. They should be grown in a sunny frame, or on a shelf in a greenhouse during warm weather. They must be protected from frost in winter; a dry shelf in a heated greenhouse or shed being the best position for them. Some of the kinds may be left outside if planted in a dry, sunny border. They require a compost of turfy loam, with a little rotten manure and sand; and should be repotted about every two years. Propagated by separating the offset bulbs; or by seeds, which are freely produced.

Z. Andersoni (Anderson's).* *fl.*, perianth golden or copper-coloured, fuscous-reddish at base, striated outside, 1¾in. long; pedicel 1½in. or more long; spathe divided above; scape reddish, 3in. to 4in. long. May. *l.* narrow-linear, acute, green or slightly glaucous, 5in. to 6in. long. Monte Video, 1829. Greenhouse or half-hardy. SYN. *Habranthus Andersoni* (B. R. 1345; L. B. C. 1677; S. B. F. G. ser. ii. 70). *Z. A. aureus* and *Z. A. cupreus* have respectively golden and coppery flowers.

Zephyranthes—*continued.*

Z. A. texana (Texan). *fl.*, perianth yellow; segments round, obtuse. SYN. *Habranthus Andersoni texanus* (B. M. 3596).

Z. Atamasco.* Atamasco Lily. *fl.*, perianth white (when young, suffused with white, purple, or flesh-colour), the segments recurved, lanceolate, acute; scape terete, 6in. to 12in. long. May. *l.* linear, slightly succulent, channelled, glabrous, nearly 1ft. long. Virginia, &c., 1629. Hardy. (L. B. C. 1899.) SYN. *Amaryllis Atamasco* (B. M. 239).

Z. candida (white).* Peruvian Swamp Lily. *fl.* inodorous, erect, shortly pedicellate; perianth white, greenish at base, the segments sub-equal, ovate, obtuse, 1in. long; spathe purplish, much shorter than the pedicel; scape erect or declinate, longer or shorter than the leaves. September. *l.* fascicled, linear, flat, highly glabrous, fleshy, of a pleasing green, 2in. to 8in. long. Buenos Ayres, 1822. Greenhouse. (B. M. 2107; L. B. C. 1419.) SYN. *Amaryllis candida* (B. R. 724).

Z. carinata (keeled).* *fl.*, perianth tube green, ¾in. long, straight, the segments pink, 2in. long, obovate-oblong, acute, many-nerved; pedicel 1½in. long, shorter than the tubular, bifid spathe; scape 1ft. high, glabrous, reddish at base. May. *l.* ⅝in. broad, channelled, keeled, green, reddish at base. Mexico, 1824. Half-hardy. (B. M. 2594; S. B. F. G. ser. ii. 4.) *Z. grandiflora* is a form with pretty, blush flowers 3in. long. (B. R. 902 [the flower only; the leaves belong to another species].)

Z. citrina (citron-yellow).* *fl.*, perianth tube ½in. to ¾in. long, the segments bright yellow, 1½in. long, oblong, sub-acute, connivent; pedicel less than 1in. long; spathe short, tubular; scape 4in. to 5in. long, tinged with red-brown below. August. *l.* three or four, narrow-linear, bright green, about 1ft. long, ¼in. broad, deeply channelled above, rounded below, reddish-brown towards the base. Tropical America. (B. M. 6605.)

Z. concolor (one-coloured). *fl.*, perianth pale green or sulphur-coloured, nearly regular, erect, the segments oblong, acute; spathe tubular, coloured, shorter than the pedicel. April *l.* erect, glaucescent. *h.* 1ft. Mexico, 1844. Greenhouse. SYN. *Habranthus concolor* (B. R. 1845, 54).

Z. flava (yellow). *fl.* sessile; perianth of a beautiful pale golden-yellow, 3in. to 4in. long, the segments lanceolate, acute; spathe bifid, rather longer than the perianth tube; scape terete, in cultivation shorter than the leaves, longer and more robust in the wild state. May. *l.* one or two, linear, narrowed and recurved at apex, dark green, channelled. *h.* 1ft. Peru, 1833. Greenhouse. SYNS. *Pyrolirion aureum* (B. R. 1724), *P. flavum.*

Z. gracilifolia (slender-leaved). *fl.* pedicellate, erect, closing at night, inodorous; perianth rose-coloured, 1⅜in. long, the tube green; pedicel 2in. to 2½in. long; spathe tubular, cut at apex, 1½in. long; scape 7in. to 8in. long, purplish at base. January. *l.* 1½ft. long, very slender, sub-cylindrical, shining green, deeply channelled above. South America, 1821. Hardy. SYN. *Habranthus gracilifolius* (B. M. 2464).

Z. g. Boothiana (Booth's). *fl.*, perianth pink, nodding; pedicel purplish; scape erect. *l.* glaucous-green, round and blunt at apex. Brazil, 1822. SYN. *Habranthus gracilifolius Boothianus* (B. R. 1967).

Z. grandiflora (large-flowered). A form of *Z. carinata.*

Z. macrosiphon (large-tubed). *fl.*, perianth bright rose-red, 2½in. to 2¾in. long, the segments sub-erect, obovate, obtuse, about ½in. broad; pedicel about 1in. long; spathe two-valved, 1½in. long; scape terete, about as long as the leaves. *l.* three or four, linear, 1ft. long, ¼in. broad, bright green, rather fleshy, shallowly channelled. Mexico, 1881.

Z. mesochloa (half-green). *fl.*, perianth green below, white above, red externally, 1⅜in. long, the tube very short, the outer segments ⅝in. broad, the inner ones narrower, all acute; pedicel about 1in. long; spathe fenestrate or divided at apex; scape 7in. long. June. *l.* eight or nine, green, channelled, acute. Buenos Ayres, 1825. Half-hardy. (B. R. 1361.)

Z. pumila (dwarf). *fl.*, perianth rose-coloured, drooping, the segments spreading; scape short. September. *l.* narrow. Chili, 1831. Greenhouse. SYN. *Habranthus pumilus* (L. B. C. 1771).

Z. robusta (stout). *fl.*, perianth purplish-rose, becoming white, 3½in. long, with scarcely any tube, the outer segments broader than the inner ones; spathe ⅝in. long, undivided, the pedicel rather longer; scape robust. June. *l.* slightly glaucous, channelled. Bonaria, 1828. Greenhouse. SYN. *Habranthus robustus* (L. B. C. 1761; S. B. F. G. ser. ii. 14).

Z. rosea (rose-coloured).* *fl.* smaller than in *Z. carinata*; perianth rose-coloured, regular, erect, the segments rotate-spreading, oval, apiculate, green below the middle, nearly free to the base; pedicel 1½in. long; spathe reddish, bilobed; scape 6in. long, compressed. May. *l.* linear, flat, glabrous, striated, rounded at apex, 6in. or more long, recumbent. Cuba, 1828. Plant tufted, half-hardy. (B. M. 2537; B. R. 821.)

Z. sessilis (sessile). *fl.*, perianth tube more than ½in. long, the limb white, the outer segments more or less red; ovary sessile; style much deflexed. April. *l.* slender, semi-cylindric, green, 8in. to 9in. long. Mexico, 1870. Greenhouse. (Ref. B. 212.)

Z. s. striata (striated). *fl.*, perianth segments striated with red outside; style longer than the filaments. 1824 SYN. *Z. striata* (B. M. 2593.)

Zephyranthes—*continued.*

Z. s. verecunda (modest). *fl.*, perianth tube green, ⅝in. long, the limb white, 1½in. long, reddish outside; sepaline filaments shorter, petaline ones longer, than the style. 1824. SYN. *Z. verecunda* (B. M. 2583; Ref. B. 356).

Z. Spofforthiana (Spofforth). A synonym of *Z. tubispatha hybrida.*

Z. striata (striated). A variety of *Z. sessilis.*

Z. tubispatha (tubular-spathed). *fl.* fragrant, slightly nodding; perianth white, nearly 2in. long, with scarcely any tube; pedicel nearly 2in. long; spathe 1in. long, erect, cylindrical, bifid; scape 3in. to 4in. long, purplish at base. May. *l.* few, ligulate-linear, equalling the scape, two to three lines broad, slightly obtuse. Jamaica. Stove. SYN. *Amaryllis tubispatha* (B. M. 1586).

Z. t. hybrida (hybrid). *fl.*, perianth flesh-coloured. A hybrid between *Z. tubispatha* and *Z. carinata.* SYN. *Z. Spofforthiana* (B. R. 1746).

Z. verecunda (modest). A variety of *Z. sessilis.*

Z. versicolor (various-coloured). *fl*, perianth at first rose-coloured, at length white, suffused with rose-colour, red at apex, red-striated below, the middle nerve green, 2in. long; pedicel 1½in. long, pale green; spathe and scape at first rose-coloured, becoming red, the former 1½in. long, the latter 5in. long. Winter. *l.* three or more, nearly 1ft. long, ¼in. broad, acute. South America, 1821. Hardy. SYN. *Habranthus versicolor* (B. M. 2485).

ZEPHYR FLOWER. *See* **Zephyranthes.**

ZERUMBET. Included under **Zingiber** (which *see*).

ZEUXINA (from *zeuxis*, a joining; so called from the coherence of the petals with the upper sepal). SYNS. *Adenostyles*, *Psychechilus*, *Tripleura.* Including *Haplochilus* and *Monochilus* (of Wallich). ORD. *Orchideæ.* A genus comprising about seventy-six species of slender or dwarf, stove, terrestrial Orchids, inhabiting the East Indies, the Malayan Archipelago, and tropical Africa. Flowers small, in sessile spikes; upper sepal erect, concave, the lateral ones spreading; petals narrow, often cohering with the upper sepal in a hood; lip adnate to the base of the very short column, erect, concave or slightly saccate at base, within naked, or with two calli, more or less contracted above the base. Leaves linear, ovate, or lanceolate, petiolate. Only one species calls for mention here. It requires similar treatment to that recommended for **Anœctochilus.**

Z. regia (royal). Striped King of the Woods. *fl.* white and green, in loose spikes; lip split into a pair of roundish, crenate lobes. *l.* ovate-lanceolate, 3in. long, with a dark green margin and a broad, pale lilac or whitish band down the centre. *h.* 5in. Borneo. SYNS. *Anœctochilus lineatus*, *Haplochilus regium*, *Monochilus regium.*

ZEUZERA ÆSCULI (Wood Leopard Moth). A handsome Moth, with a spread of wings of from 2in. to 3in. The body is from 1¼in. to 1½in. long, and is rather

FIG. 255. ZEUZERA ÆSCULI (FEMALE).

slender; and the wings are narrower than is usual in Moths. All the wings are semi-transparent white, with numerous spots (see Fig. 255), which are blue-black

Zeuzera Æsculi—*continued.*

on the fore wings, and lighter on the hind wings. The thorax is white, with a row of three large, black spots on each side, and a smaller one behind. The abdomen is grey. The antennæ are slender in the female, but in the male the basal half of each is like a double comb.

FIG. 256. LARVA OF ZEUZERA ÆSCULI.

The larva (see Fig. 256) is cylindrical, naked, yellowish-white, with raised, shining, black spots, a blackish plate on the front of the ring just behind the head, and a black patch on the last segment. It feeds in the wood of living trees—among the kinds attacked by it being Apple, Elm, Horse-Chestnut, Pear, Plum, and Poplar—but seldom does noteworthy injury to them; indeed, Newman observed that infected trees bore even more abundant fruit than perfectly healthy ones. Should remedies be required, the best are the removal (for firewood) of infested trunks, the capture of the Moths on the trees in early morning, and plastering the lower part of the trunk with a mixture of clay and cow's urine. Insecticides may be injected into holes made by the larvæ, should such be found.

ZEXMENIA (an anagram of *Ximenesia*). SYN. *Lipochæte* (in part). ORD. *Compositæ.* A genus embracing about twenty-five species of stove, greenhouse, or hardy, annual or perennial herbs or sub-shrubs, sometimes tall climbers, inhabiting the warmer parts of America. Flower-heads yellow, solitary, corymbose, or sub-umbellate, heterogamous, radiate; involucre variable, the bracts in two, three, or several series; receptacle convex, the pales sheathing the flowers; ray florets ligulate, spreading, entire, or two or three-toothed; disk florets tubular, the apex shortly five-cleft; achenes usually slightly pilose. Leaves opposite, entire or toothed. Only two species call for mention here. They thrive in any fairly rich soil. *Z. aurea* may be increased by cuttings, inserted in sandy soil, under a glass, in heat; and *Z. ovata* may be readily propagated by seeds, sown on the open border.

Z. aurea (golden). *fl.-heads* golden-yellow, solitary and terminal in the upper axils; ray florets seven to nine, twice as long as the involucre. September. *l.* opposite, sessile, ovate-lanceolate, obtuse at base, slightly acuminate at apex, serrated, puberoscabrous on both sides. Branches terete, villous-canescent. *h.* 1½ft. Mexico, 1829. Half-hardy sub-shrub. SYNS. *Verbesina aurea*, *Wedelia aurea* (B. M. 3384).

Z. ovata (ovate-leaved). *fl.-heads* deep orange-yellow; ray florets elliptical; peduncles short, terminal, sometimes solitary, sometimes arranged in a kind of corymb. Autumn. *l.* sessile, the basis (scarcely a petiole) amplexicaul, ovate, acute, serrated, triple-nerved, paler beneath. Stem rounded, branched, hairy. *h.* 2ft. Mexico, 1828. Hardy annual. SYN. *Tithonia ovata* (B. M. 3901).

Z. texana (Texan). A synonym of *Wedelia hispida.*

ZICHYA. Included under **Kennedya** (which *see*).

ZIERIA (named after John Zier, a Polish botanist, who was a friend of Smith, the nomenclator). Australian Turmeric-tree. ORD. *Rutaceæ.* A genus comprising half-a-score species of greenhouse, glabrous, hirsute, or tomentose shrubs or small trees, endemic in Australia. Flowers white, usually small, axillary, in small, trichotomous cymes, or rarely solitary; calyx four-cleft; petals four, imbricated or almost valvate in bud, spreading; stamens four. Leaves usually opposite, with three leaflets, rarely alternate or simple. A selection of the introduced species is here given. They thrive in a mixture of sandy loam and peat, and flower at midsummer. Young cuttings root readily in sand, under a glass.

Zieria—*continued.*

Z. arborescens (tree-like). A synonym of *Z. Smithii macrophylla.*

Z. hirsuta (hirsute). A synonym of *Z. pilosa.*

Z. lævigata (smooth). *fl.*, petals three times as long as the calyx; cymes few-flowered, about as long as the leaves. *l.*, leaflets three on a common petiole, linear, pointed, ¼in. to 1in. long, the margins closely revolute. *h.* 1½ft. 1822. A glabrous, erect shrub. (B. iv. 185; P. M. B. ix. 77.)

Z. lanceolata (lance-leaved). A synonym of *Z. Smithii.*

Z. macrophylla (large-leaved). A form of *Z. Smithii.*

Z. obcordata (obcordate). *fl.* one to three in the axils, very small, on short, slender pedicels. *l.*, leaflets three, on a very short common petiole, obovate or obcordate, two to four, or rarely six lines long, softly pubescent or tomentose above, more hirsute or velvety and whitish beneath, the margins recurved or revolute. 1824. A shrub of low growth.

Z. pilosa (pilose). *fl.* small, solitary, and nearly sessile, or two or three together on short pedicels. *l.*, leaflets three, on a short common petiole, linear, oblong, or lanceolate, obtuse, ¼in. to ⅜in., or rarely 1in. long, slightly pubescent or glabrous above, more or less hirsute or tomentose beneath, the margins recurved or revolute. *h.* 4ft. 1822. A shrub or under-shrub, with densely pubescent or hirsute branches. SYN. *Z. hirsuta.*

Z. Smithii (Smith's).* Sandfly Bush; Tasmanian Stinkwood. *fl.* usually about ⅛in. in diameter, in axillary, bi- or trichotomous cymes, shorter than the leaves. *l.*, leaflets three, with a distinct common petiole, lanceolate, or the larger ones oblong, elliptic, acute or rarely obtuse, 1in. to 2in. long, flat, or the margins slightly recurved. 1808. A tall shrub or small tree, glabrous or slightly pubescent. (A. B. R. 606; B. M. 1395.) SYN. *Z. lanceolata* (L. B. C. 878).

Z. S. macrophylla (large-leaved). *fl.* larger than in the type. *l.*, leaflets often 3in. long. A more arborescent form. SYNS. *Z. arborescens, Z. macrophylla* (B. M. 4451).

ZIETENIA. A synonym of **Stachys** (which *see*).

ZIGADENUS. *See* **Zygadenus.**

ZILLA (the Arabic or Egyptian name of the plant). ORD. *Cruciferæ.* A small genus (four species) of half-hardy, suffrutescent herbs, inhabiting North Africa, Arabia, and Persia. Flowers white or violet, solitary or loosely racemose, ebracteate. Leaves oblong, toothed, rather thick. Two of the species have been introduced, but probably they are not now in cultivation.

ZINGIBER (from the Greek *Zingiberis*, used by Dioscorides, which is in its turn derived from the Sanscrit, and means in that language horn-shaped; probably in reference to the form of the rhizomes). Including *Zerumbet.* TRIBE *Zingibereæ* of ORD. *Scitamineæ.* A genus comprising about twenty species of stove or greenhouse, perennial herbs, with horizontal, tuberous rhizomes, inhabiting the East Indies, the Malayan Archipelago, and the Mascarene and Pacific Islands. Flowers one to three to a bract, borne in spike-like, dense, cone-formed, or rather long thyrses; calyx tubular, shortly three-lobed; corolla lobes narrow, the upper one erect, incurved, the lateral ones spreading; lip or lips entire or shortly bifid, sometimes slightly crisped. Stems leafy, floriferous or sterile. Several of the species are grown in our hothouses as curiosities. The rhizomes of *Z. officinale* furnish the well-known spice called ginger. The plants here described thrive in a compost of loam, peat, and sand, and require stove heat. They may be increased by divisions. During the winter many die down, and then, until growth begins again, water should be almost withheld.

Z. brevifolium (short-leaved). *fl.* yellow, rather small, with narrow segments, and a narrow, three-lobed lip; spike 2½in. to 3in. long, fusiform, with adpressed, oblong, orange-yellow bracts, striped with red. *l.* few, oblong-lanceolate or elliptic, 2in. to 4in. long, 1¼in. to 1⅔in. broad. Stems naked below. *h.* 1ft. Philippine Islands, 1886.

Z. Cassumunar (Cassumunar). Bengal Root. *fl.* pale sulphur; lip four-cleft, the lateral lobes shorter; bracteoles ovate, bilobed; bracts nearly round, reddish, pilose; thyrse ellipsoid; scape 8in. to 14in. long, red-sheathed. July and August. *l.* sessile, lanceolate, pilose beneath and on the sheaths. Stems annual, 3ft. to 5ft. high. Root yellow. East Indies, 1807. (B. M. 1426.)

Z. Cliffordiæ (Lady de Clifford's). *fl.*, corolla white, the segments lanceolate, sub-equal; lip simple; lower bracts broadly cuneate, the upper ones scarlet, margined with green, ovate, obtuse; thyrse ovate; scape 3in. to 4in. long. *l.* long-lanceolate. Stem purplish at base. Guinea. Probably a variety of *Z. Cassumunar.* (A. B. R. 555.)

Zingiber—*continued.*

Z. coloratum (coloured). *fl.* of a creamy-white colour; inflorescence radical, fusiform, acute, densely covered with crimson bracts. *l.* distichous, lanceolate, acuminate, sub-sessile. Stems purplish, leafy, 3ft. high. North-west Borneo, 1879.

Z. elatum (tall). *fl.* of a bright, lively yellow; spikes terminal, solitary, narrow-lanceolate, 6in. long. July and August. *l.* linear, recurved, 1ft. to 1½ft. long, 1in. broad, smooth above, softly white-hairy beneath. Stems straight, 4ft. to 5ft. high. Root tuberous. East Indies, 1820.

Z. officinale (officinal). Ginger. *fl.*, corolla lobes pale yellow, lanceolate; lip dark blue and variegated, three-lobed; bracts imbricated, roundish-ovate, blunt, membranous; spike ovoid, dense, 1½in. to 2in. long; scape radical, 1ft. to 1½ft. high. July. *l.* linear-lanceolate, acuminate, 8in. to 12in. long, tapering towards the bilobed ligule. Sterile stem twice or thrice as long as the scape. East Indies, 1605. (B. M. Pl. 270.)

Z. Parishii (Parish's). *fl.*, corolla straw-coloured, with purple veins; bracts yellow-green, with a scarlet margin; spikes cylindrical, 4in. to 6in. long. July. *l.* elliptic-lanceolate, 4in. to 7in. long. Rhizomes creeping, 3ft. long. *h.* 3ft. Moulmein, 1873. (B. M. 6019.)

Z. Zerumbet (Zerumbet). *fl.* pale sulphur, large; lateral lobes of lip very large; bracts one-flowered; spikes oval, obtuse, about the size of a goose egg, on long peduncles. Summer. *l.* sessile, broadly lanceolate, entire, smooth, waved. Stems annual, 3ft. to 4ft. high. Root white outside, pale yellow within. East Indies, 1690. (B. M. 2000; S. E. B. 112.)

ZINGIBEREÆ. A tribe of *Scitamineæ.*

ZINNIA (named in honour of John Godfrey Zinn, 1727-1759, Professor of Botany at Gottingen). Youth and Old Age. SYNS. *Crassina, Lejica.* ORD. *Compositæ.* A genus embracing about a dozen species of half-hardy,

FIG. 257. FLOWERING BRANCH OF SINGLE STATE OF ZINNIA ELEGANS.

Mexican, annual or perennial herbs or sub-shrubs. Flowerheads variously coloured, heterogamous, radiate, mediocre or large, pedunculate, at the tips or forks of the branches; involucre campanulate or sub-cylindrical, the bracts in three or several series, the outer ones gradually shorter; receptacle conical or at length cylindrical; ray florets

Zinnia—*continued.*

ligulate, spreading, in one series; disk florets tubular, shortly five-cleft at apex; achenes narrow, striated, glabrous or ciliated at the angles. Leaves opposite, entire. The best-known species (all annuals) are here described. They flower during the summer months. *Z. elegans* and *Z. multiflora* last a long time in beauty. Zinnias succeed best in a rich, deep, loamy soil, and in a sunny situation. Seeds should be sown on a gentle hotbed at the end of March or in April, and the young plants thrive best if pricked off in frames when large enough. They should be transferred to the situations in which they are intended to flower early in or about the middle of June. If sown too early, and allowed to become starved previous to the final planting, they never succeed so well afterwards. From *Z. elegans* most of the garden varieties have descended; there are numerous single and double forms, all of which are fine, free-flowering subjects when well grown.

Z. elegans (elegant).* *fl.-heads* scarlet, crimson, rose-coloured, buff, or white; involucral bracts ovate, obtuse, the upper ones margined with black; pales of the receptacle serrate-crested; peduncles cylindrical, solitary, longer than the leaves. *l.* sessile, amplexicaul, cordate-ovate. Stem erect, hairy. *h.* 2ft. 1796. See Fig. 257. The following are varieties: *coccinea*, upper ray florets of a beautiful scarlet (B. R. 1294; P. M. B. i. 223, under name of *Z. violacea coccinea*); *Darwini*, a splendid hybrid; *flore-pleno*, a fine, double-flowered variety (B. H. 1861, p. 201, and 1862, p. 193); *violacea*, upper ray florets purplish-violet (A. B. R. 55, under name of *Z. violacea*; B. M. 527, under name of *Z. elegans*).

Z. Haageana (Haage's). *fl.-heads* similar in size to those of *Z. elegans*; ray florets brilliant golden-yellow or orange. Summer. *l.* sub-sessile or sessile, and, as well as the stems, hairy-pubescent. *h.* 1ft. to 1½ft. Central America (?), 1862. (R. G. 1863, 390.)

Z. hybrida (hybrid). *fl.-heads* scarlet; involucral scales adpressed; pales entire; peduncles terminal, solitary, short. *l.* cordate, somewhat lanceolate, sessile, amplexicaul. Stems erect, pubescent. *h.* 2ft. 1818. Probably a hybrid between *Z. elegans* and *Z. pauciflora*. (B. M. 2123.)

Z. multiflora (many-flowered). *fl.-heads*, involucre campanulate, with adpressed scales; pales obtuse; ray florets scarlet or red; disk yellow; peduncles exceeding the leaves. *l.* scarcely petiolate, ovate-lanceolate. Stems erect, branched, very slightly hairy. *h.* 2ft. 1770. Allied to *Z. pauciflora*. (B. M. 149.)

Z. pauciflora (few-flowered). *fl.-heads* yellow; involucral scales adpressed; pales entire; ray florets obovate, obtuse or one or two-toothed at apex; terminal peduncles striated, obconical, the lateral ones slenderer. *l.* sessile, cordate-lanceolate, somewhat amplexicaul. Stem erect, hairy. *h.* 2ft. 1753.

Z. tenuiflora (slender-flowered). *fl.-heads* on very long, cylindrical peduncles; involucre oblong, the scales adpressed, scarcely margined; ray florets scarlet, seven to eight lines long, entire or bidentate and revolute at apex. *l.* very shortly petiolate, cordate-lanceolate. Stems erect, scarcely pubescent. *h.* 2ft. 1799. (B. M. 555.)

Z. verticillata (whorled). *fl.-heads* red; involucre campanulate, with adpressed scales; ray florets obovate, emarginate at apex, often in two or three series; peduncles short, obconical. *l.* oblong-lanceolate, sometimes crowded in irregular whorls, sometimes spirally disposed. Stems erect, sparsely hairy. *h.* 2ft. 1789. (A. B. R. 189.) "Probably a robust cultivated state of *Z. elegans*" (Hemsley).

ZIZANIA (adapted from *Zizanion*, the old Greek name of some wild grain; it is the word which, in the New Testament, is translated "tares"). Water or Indian Rice. SYNS. *Hydropyrum, Melinum.* ORD. *Gramineæ.* A small genus (two species) of tall, hardy, aquatic Grasses, natives of North America. Flowers monœcious; spikelets jointed with the club-shaped pedicels, very deciduous; glumes wanting or rudimentary; panicle ample, terminal. Leaves long and flat. The grain of *S. aquatica* (Canada or Indian Rice; Water Oats) is largely gathered for food by the North-west American Indians. The species have no horticultural value.

ZIZIA. Included under *Carum.*

ZIZIPHORA (from *Zizi*, which is said to be the Indian name of the flower, and *phoreo*, I bear). ORD. *Labiatæ.* A genus comprising about a dozen species of hardy dwarf, annual herbs or diffuse sub-shrubs, inhabiting Central and Western Asia, and the South Mediterranean region.

Ziziphora—*continued.*

Flowers small, sub-sessile, or on short pedicels; calyx tubular, elongated, bilabiate; corolla tube scarcely exserted, the upper lip erect and entire, the lower one spreading and three-cleft; perfect stamens two; whorls few-flowered, axillary, clustered on the upper part of the stem. Leaves small, entire or few-toothed; floral ones conformed or slightly shorter and broader. The best-known species are here described. Both are half-hardy sub-shrubs, and thrive in any good, light soil. Propagation may be effected by cuttings.

Z. clinopodioides (Clinopodium-like). *fl.* blue-purple; corolla nearly twice as long as the calyx; whorls few, six to ten-flowered, approximating in a rather loose, sub-globose head. June. *l.* at length nearly all ovate, the upper ones narrow, oblong, or ovate, ¾in. long, narrowed to short petioles. Branches diffuse, 6in. to 12in. long, often purplish. Siberia, 1821.

Z. c. media (intermediate). *fl.*, calyx pilose. *l.* mostly narrow. (B. M. 906, under name of *Z. serpyllacea.*)

Z. dasyantha (thick-flowered). *fl.* red; calyx very pilose-hispid; corolla shorter than in *Z. clinopodioides*; whorls approximating in an oblong head, or the lower ones distinct. July. *l.* ovate or oblong; floral ones conformed. *h.* 6in. Siberia, 1803. (B. M. 1093, under name of *Z. Pouschkini.*)

ZIZYPHUS (*Zizouf* is the Arabic name of the Lotus). ORD. *Rhamneæ.* A genus comprising about fifty species of stove, greenhouse, or hardy trees or shrubs, often decumbent or sarmentose, and frequently prickly; they inhabit tropical Asia and America, and the temperate regions of both hemispheres. Flowers greenish, small, fascicled or in sessile or pedunculate cymes; calyx with five spreading lobes; petals five, cucullate, deflexed, rarely absent; stamens five. Fruit fleshy or dry, with a woody or bony, one to four-seeded and one to four-celled stone. Leaves sub-bifarious, alternate, usually coriaceous. A selection of the introduced species is here given. The fruits of *Z. vulgaris* are commonly eaten, both fresh and in a dried state, in the Mediterranean region, and afford the jujubes of the shops. *Z. Lotus* is supposed to have yielded the seductive, sweet fruits from which the ancient Lotophagi took their name. An excellent dessert fruit is obtained from *Z. Jujuba*, a species largely cultivated by the Chinese. *Z. spina-Christi* is supposed by some persons to have furnished the crown of thorns placed on our Saviour's head at His Crucifixion. The stove and greenhouse species thrive in a compost of sand, loam, and peat; and ripened cuttings of them root readily in sand, under a glass, those of the stove species requiring heat. The hardy kinds are admirably adapted for planting in shrubberies: they may be propagated by ripened cuttings, inserted in soil, under a glass; or by pieces of the roots.

Z. incurva (incurved). *fl.* in pedunculate, axillary cymes ⅜in. long. June. *fr.* ⅜in. long, ellipsoid, two-celled. *l.* 2⅜in. long, ovate or ovate-oblong, acute or slightly acuminate, crenate-serrated, glabrous. *h.* 6ft. and upwards. Nepaul, 1823. Hardy, unarmed tree.

Z. Jujuba (Jujube). Jujube-tree. *fl.* in cymes ⅜in. long. April. *fr.* ½in. to ¾in. in diameter, globose, fleshy and mealy. *l.* 1in. to 2½in. long, elliptic-ovate to sub-orbicular, dark green and glabrous above, densely woolly-tomentose beneath. Young branches and flowers densely fuscous-tomentose. *h.* 30ft. to 50ft. North Africa, India, Australia, 1759. Greenhouse tree, usually armed. See Fig. 258. (B. F. F. 17; B. F. S. cxlix.; J. B. i. 140.)

Z. Lotus. African or Jujube Lotus. *fr.* yellow, roundish-ovate, small, farinaceous. *l.* ovate-oblong, obsoletely crenated, and, as well as the branchlets, glabrous. Prickles twin, one recurved, the other straight, longer than the petioles. *h.* 2ft. to 4ft. South Europe, North Africa, 1731. Half-hardy shrub.

Z. mucronata (mucronate-leaved). *fl.*, cymes axillary, about as long as the petioles. June. *fr.* red, scarcely the size of a cherry. *l.* petiolate, ovate or cordate-ovate, obtusely acuminate, mucronulate, 1½in. to 2in. long, crenate-serrated, sometimes hairy on the nerves beneath. Branches greyish, flexuous, prickly. *h.* 25ft. South Africa, 1810. Greenhouse tree.

Z. Paliurus (Paliurus). A synonym of *Paliurus aculeatus.*

Z. spina-Christi. Christ's-Thorn. *fl.* on villous-tomentose, corymbose peduncles. August. *fr.* ovate-globose. *l.* ovate, obtuse, toothed, glabrous or pubescent beneath. Branchlets white; prickles twin, spreading, one straight, the other slightly incurved. *h.* 6ft. West Asia, North Africa, Egypt. Hardy shrub.

Z. vulgaris (common). *fl.* few, fascicled in the axils of the

Zizyphus—*continued.*

leaves. August. *fr.* red or black, succulent, ½in. in diameter. *l.* ¾in. to 2½in. long, sub-obliquely ovate, obtuse or sub-acute, crenate-serrated, glabrous. Prickles usually twin. *h.* 6ft. and upwards. South Europe, &c., 1640. Hardy shrub or small tree. (S. F. G. 241.)

ZOMICARPA (from *zoma*, a kind of skirt, and *karpos*, a fruit; the pericarp of the fruit, when ripe, bursts at the bottom and remains, covering the seeds like a skirt). ORD. *Aroideæ* (*Araceæ*). A small genus (three species) of stove, tuberous, perennial herbs, natives of Brazil. Flowers monœcious; perianth none; spathe rather fleshy, persistent, the tube convolute, hooded at base, with connate margins, the throat constricted, the lamina lanceolate, acuminate, reticulate-veined; spadix shorter than, and adnate at base with, the spathe, with a slender appendage; male inflorescence dense, female few-flowered; peduncle slender, equalling the leaves. Leaves appearing before the flowers, long-petiolate, reniform, tripedatisect; segments elliptic-oblong, the lateral ones smaller; petioles sheathing towards the base. The species require similar culture to that recommended for **Staurostigma**.

Zomicarpa—*continued.*

FIG. 258. FRUITING BRANCHLET OF ZIZYPHUS JUJUBA.

Z. Pythonium (Pythonium). *fl.*, spathe glaucous-violet; spadix slightly exceeding the spathe tube, the naked part subulate, shorter than the inflorescence; peduncle terete. *l.* reniform; segments five, distant at base, the lateral ones half-lanceolate and ovate-oblong, the middle one broadly elliptic; petioles slender, terete, rather broadly sheathing, thrice as long as the blades. *h.* 1ft. 1860. This plant is regarded as an antidote in cases of serpent bites.

Z. Riedeliana (Riedel's). *fl.*, spathe green; spadix much exceeding the spathe tube, the naked part club-shaped, longer than the inflorescence. *l.* reniform; segments mucronate-cuspi-

Zomicarpa—*continued.*

date, the upper one distant from the approximate lateral ones; petioles thrice as long as the leaves, rather broadly sheathing at base. *h.* 1ft. 1860. (Ref. B. 15.)

Z. Steigeriana (Steiger's). *fl.*, spathe blackish-purple, arched at apex; spadix whitish and dark fuscous-purple, not reaching beyond the middle of the spathe, the appendage club-shaped; peduncle rather longer than the petioles. *l.* green, paler beneath, trisected; segments equal or unequal, oblong- or ovate-lanceolate, acuminate at apex, abruptly cuneate at base; petioles fuscous-spotted and striolate. *h.* 1ft. 1860.

ZOMICARPELLA (a diminutive of *Zomicarpa*). ORD. *Aroideæ* (*Araceæ*). A monotypic genus. The species is a rather small, slender, tuberous-rooted, stove herb, allied to *Zomicarpa*. For culture, *see* **Staurostigma.**

Z. maculata (spotted). *fl.*, inflorescence very small; spathe dull green, 1in. long, lanceolate, spreading out nearly flat, with revolute margins; spadix blackish, 1½in. long, very slender. *l.* ovate, deeply cordate-sagittate at base, dark green, with a series of irregular, pale green blotches arranged around, near the margins, somewhat resembling those of *Caladium marmoratum*, but much smaller. New Grenada, 1881.

ZORNIA (named after John Zorn, of Bavaria, 1739-1799, a botanical author). Including *Myriadenus*. ORD. *Leguminosæ*. A genus consisting of half-a-score species of stove or greenhouse, annual or perennial herbs, all American, one being also found in South Africa. Flowers interruptedly spicate or solitary, on axillary and terminal peduncles. Pods compressed. Leaves digitately two or four-foliolate; leaflets often pellucid-dotted. Several species have been introduced, but they are more curious than beautiful. Probably, *Z. tetraphylla* is no longer in cultivation

Z. tetraphylla (four-leafleted). *fl.* yellow; bracts glabrous, as long as the pods, five-nerved. July. *fr.*, pods prickly; prickles somewhat scabrous. *l.*, leaflets four, digitate, oblong, acuminate. *h.* 6in. Carolina, 1824. Greenhouse perennial. SYN. *Anonymos bracteata.*

ZOSTERA (from *zoster*, a riband; alluding to the leaves). Grasswrack. SYN. *Alga.* ORD. *Naiadaceæ.* A small genus (four species) of hardy, Grass-like, marine plants, found on various coasts in the temperate zone. Flowers in two parallel series of alternating anthers and carpels on one surface of a linear, membranous, pedunculate spadix, which is inclosed in a sheathing, leaf-like spathe; perianth none. Leaves distichous, sheathing, long-linear. *Z. marina* (Bell Ware; Wrack Grass, &c.) is a British plant, found in muddy and sandy estuaries near low-water mark. *Z. nana* is another native species.

ZOSTEREÆ. A tribe of *Naiadaceæ.*

ZOSTEROSTYLIS (from *zoster*, a riband, and *stylos*, a column; alluding to the band which surrounds the column). *Cryptostylis* is now the correct name. ORD. *Orchideæ.* A small genus (seven species) of stove or greenhouse, terrestrial Orchids; three inhabit the East Indies and the Malayan Archipelago, and the rest are Australian. Flowers rather large, in a loose raceme or spike; sepals and petals sub-equal, very slender, convolute and appearing subulate when the flower opens; lip superior, sessile, with a broad base inclosing the column, contracted above the column, and expanded into an undivided lamina; column very short; scapes leafless, simple, two or many-sheathed; bracts membranous, acute. Leaves few or solitary, on rigid petioles, oblong or narrow, membranous. For culture of *Z. arachnites*, the only species introduced, *see* **Spiranthes.**

Z. arachnites (cobwebby). *fl.* few or many in a loose spike 3in. to 8in. long, sessile; petals dull green, linear, and, as well as the longer sepals, much spreading; lip yellowish, mottled and lined with purple, pubescent or cobwebby, erect, elliptic-ovate or lanceolate, acute, grooved; scape 6in. to 18in. high, the base (and petioles) purple. *l.* long-petiolate, ovate, acuminate, striate-nerved. Root consisting of a few elongated tubers. Ceylon, 1863. (B. M. 5381.)

ZUCCAGNIA. A synonym of **Dipcadi** (which *see*).

ZWINGERA. A synonym of **Simaba** (which *see*).

ZYGADENUS (from *zygos*, a yoke, and *aden*, a gland; the glands are usually arranged in pairs at the base of the perianth segments). Erroneously spelt *Zigadenus*. Including *Amianthemum* and *Anticlea*. ORD. *Liliaceæ.* A genus comprising about a dozen species of hardy, bulbous or rhizomatous plants; one is a native of Siberia, and the rest inhabit North America, extending as far as Mexico. Flowers in a terminal, simple or paniculately-branched raceme; perianth persistent, the segments sometimes connate at base in a very short, turbinate tube, in other cases distinct, sub-equal, flat; stamens six, little shorter than the segments. Leaves radical, or clustered at the base of the stem, long-linear. Stem erect, simple below the inflorescence, with or without a few small leaves. The best-known species are here described; all are North American. A moist, peat soil is best suited to their requirements. Propagation may be readily effected by divisions, or by seeds.

Z. angustifolius (narrow-leaved). *fl.*, perianth white, turning purple, ¼in. to ½in. long; lower pedicels five to six lines long; raceme 1in. to 3in. long, ½in. to ¾in. broad. May and June. *l.* nearly 1ft. long, two to three lines broad, firmer and more distinctly ribbed than those of *Z. Muscætoxicum*. Stem slender, 1ft. to 1½ft. high, with many reduced leaves. 1823. SYNS. *Amianthium angustifolium, Helonias angustifolia, H. læta minor* (B. M. 1540).

Z. elegans (elegant). A synonym of *Z. glaucus.*

Z. Fremonti (Fremont's). *fl.*, perianth cream-coloured, five to six lines long, the segments oblong, obscurely clawed; racemes corymbose, 2in. to 4in. long, simple or paniculate. June. *l.* three or four, linear, rather firm, 1ft. to 1½ft. long, three to four lines broad, acuminate. 1874.

Z. glaberrimus (highly glabrous).* *fl.*, perianth white, five to six lines long, the segments oblong, acute, distinctly clawed; pedicels ascending, three to six lines long; racemes five to ten-flowered, loosely paniculate, 1in. to 2in. long. June. *l.* linear, Grass-like, acuminate, 1ft. to 1½ft. long, three to four lines broad. Stem erect, with many reduced leaves. Rhizome creeping. *h.* 2ft. to 3ft. 1811. SYN. *Helonias bracteata* (B. M. 1703).

Z. glaucus (glaucous-leaved). *fl.*, perianth greenish externally, whitish inside, five to six lines long, the segments oblong, thickly nerved; pedicels ascending, ¼in. to 1in. long; racemes loose, 2in. to 4in. long, 1in. to 2in. broad, simple or loosely paniculate. Summer. *l.* four to six, firm, linear, glaucous-green, thickly nerved, 1ft. to 1½ft. long, ¼in. to ½in. broad. Stem 6in. to 2ft. high, with a few reduced leaves. 1828. SYNS. *Z. elegans, Helonias glaberrima* (B. M. 1680).

Z. Muscætoxicum (fly-poison). *fl.*, perianth greenish-white, ⅛in. to ¼in. long; lower pedicels ¼in. to ¾in. long; raceme dense, oblong, 2in. to 4in. long, 1in. to 1½in. broad. Summer. *l.* many, linear-lorate, membranous, nearly 1ft. long, ½in. to ¾in. broad, obtuse. Stem slender, 1ft. to 2ft. high, with a few much-reduced leaves, slightly thickened at base. 1758. (R. G. 1121, f. 1.) SYNS. *Amianthium Muscætoxicum, Helonias læta* (B. M. 803; L. B. C. 928).

Z. Nuttallii (Nuttall's). *fl.*, perianth white, ⅛in. to ¼in. long; racemes often simple, dense above, 2in. to 3in., rarely 4in. to 6in., long; lower pedicels ½in. to ¾in. long. June. *l.* four to six, firm, linear, 1ft. to 1½ft. long, ¼in. to ½in. broad. Stem 6in. to 18in. high, with a few reduced leaves. 1885. (R. G. 1121, f. 2.)

ZYGOGLOSSUM. A synonym of **Cirrhopetalum** (which *see*).

ZYGOMENES. A synonym of **Cyanotis** (which *see*).

ZYGOMORPHOUS. A term applied to anything that can be bisected in only one plane into similar halves.

ZYGOPETALUM (from *zygos*, a yoke, and *petalon*, a petal; in the original species the sepals and petals adhere by their bases). Including *Bollea, Galeottia, Huntleya, Kefersteinia, Pescatorea, Promenæa*, and *Warscewiczella.* ORD. *Orchideæ.* A genus comprising about fifty species of very handsome, stove or greenhouse, epiphytal Orchids, inhabiting the warmer parts of America. Flowers large and showy; sepals and petals sub-equal, free or very shortly connected at base; lip affixed to the foot of the column, slightly incumbent, forming a short chin, the lateral lobes spreading or erect, clothing the column, the middle one flat and spreading; lip bearing a transverse crest, which, from being ribbed or plaited, has the appearance of a ruff or frill; column incurved, semi-terete, wingless or shortly two-winged at apex, produced in a short foot at base; pollen masses four; floriferous scapes

Zygopetalum—*continued.*

leafless, many-sheathed, one-flowered or terminated by a loose raceme; bracts small or rather broad. Leaves distichous, membranous or rather rigid, slightly plaited or with elevated veins. Stem leafy, short, at length thickening into a pseudo-bulb. The flowers are generally produced during winter—a circumstance which greatly enhances the value of Zygopetalums as decorative objects. The robust species, such as *Z. Mackayi*, may be grown along with *Cattleya Mossiæ*. They should be potted in rough peat and sphagnum, and watered freely when making their growth. During winter, they require only sufficient moisture to keep them from shrivelling. The *Pescatorea* section are much more difficult to manage. The large-leaved kinds may be grown in pans or baskets, using a mixture of peat-fibre, sphagnum, and lumps of charcoal. Some growers place these kinds on flat, dish-like saucers, with several large holes in the bottom, and simply place nodules of peat and charcoal about the roots as they multiply. Others fasten them on to large blocks of birch, placing the plants on the bark side of the block. The small, delicate kinds, such as *Z. gramineum*, thrive best in teak baskets. All the species like plenty of moisture when in full growth, and none should ever be allowed to get quite dry.

Z. africanum (African). A synonym of *Odontoglossum bictonense.*

Z. aromaticum (aromatic). *fl.* solitary, strongly perfumed, 3in. to 4in. across; sepals and petals white, lanceolate, acute; lip azure-blue, darkening to purple at the base, obreniform, many-lobuled, slightly crisped; disk smooth; a many-furrowed callus at the contracted base; scape erect. *l.* cuneate-oblong, acute. Chiriqui. Stove. (G. C. 1868, p. 75; R. X. O. i. 73.) Syns. *Huntleya aromatica, Warscewiczella aromatica.*

Z. Backhousianum (Backhouse's). *fl.*, sepals and petals creamy-white, tipped with bright purplish-violet; lip deeply three-lobed, creamy-white, having a deep yellow callus of nineteen ribs, with brownish lines to the keels, the anterior portion yellowish, with small, purplish warts. Summer. Ecuador, 1877. Allied to *Z. Klabochorum.* Stove. Syn. *Pescatorea Backhousiana.*

Z. Beaumontii (Beaumont's). *fl.* 2in. across; sepals and petals light green, longitudinally striped with pale olive-brown; lip white, dotted and streaked with pale lilac-purple, trifid, the side lobes toothed, incurved, bearing on the disk between them about seven long, parallel, acute crests; scapes erect, one or two-flowered. *l.* plicate, cuneate-oblong, light green. Pseudo-bulbs pyriform, tetragonal. Brazil, 1850. Stove. Syns. *Batemannia Beaumontii* (R. X. O. iii. 215), *Galeottia Beaumontii.*

Z. bellum (pretty). *fl.* more than 3in. across; sepals and petals light violet, banded near the tip with dark purplish-violet; lip whitish-yellow, somewhat hooded, with a large callus of twenty-one ribs, the keels of which are purplish on their back line, the tip of the lip blotched with purplish-violet; column purplish, with a yellowish-white, triangular space at base, purplish-spotted. Spring. New Grenada, 1878. Intermediate. Syn. *Pescatorea bella.*

Z. brachypetalum (short-petaled).* *fl.*, sepals and petals brown, marbled with green, short, stiff, convex, oblong, obtuse; lip white, veined with deep bluish-violet, transverse, roundish, emarginate, the crest or frill closely striped with blue; scape tall, many-flowered. *l.* lanceolate-ensiform, shorter than the scape. Brazil. Intermediate. (J. H. S. iv. [Proc.], p. 11.)

Z. Burkei (Burke's). *fl.* curiously marked, four or five on a radical scape; sepals and petals green, with thick bands of brown, which here and there break up into spots; lip white, with a ruff of about thirteen crimson plaits or folds. *l.* twin, elongated-lanceolate, acuminate. Pseudo-bulbs clustered, narrow-oblong, furrowed, about 2in. long. Guiana, 1883. Intermediate. (W. O. A. iii. 142.)

Z. candidum (white).* *fl.* 2½in. across; sepals white, lanceolate, acute; petals white, broader, reflexed; lip rosy-purple in the centre, with a broad, bluish margin, quadrate-hastate; disk bearing a large, obtriangular, ivory-white callus, with a retuse, five-toothed apex, and marked with five bluish-purple bars. *l.* few, oblong-ligulate, forming a loose, distichous tuft. *h.* 8in. to 9in. Bahia. Stove. Syns. *Huntleya candida, Warrea candida* (F. d. S. vii., p. 123; L. & P. F. G. i., p. 32), *Warscewiczella candida.*

Z. cerinum (waxy). *fl.* about 3in. across; sepals and petals pale waxy straw-colour, fleshy, concave, the lateral ones rather darker; lip yellow-clawed, convex, retuse, with a thick, semicircular ruff of numerous truncate plaits, within which is sometimes a band of deep purple, surrounding the base of the short, clavate, hoodless column; peduncles axillary, one-flowered, much shorter than the leaves. *l.* tufted, cuneate-oblong, acuminate, 1ft. long. Chiriqui, 1851. Intermediate. (F. d. S. 1815; R. G. 838.) Syns. *Huntleya cerina* (B. M. 5598; L. & P. F. G. iii., p. 62), *Pescatorea cerina* (F. M. ser. ii. 93; R. X. O. i. 65).

Zygopetalum—*continued.*

Z. citrinum (citron-coloured).* *fl.* of a deep rich yellow, with a dark crimson blotch at the base of the lip, which is obovate in the front, with two oblong, obtuse, erect basal lobes spotted with crimson; scapes deflexed, 2in. to 3in. long, one-flowered. Late summer. *l.* oblong-ligulate, pale green. Pseudo-bulbs clustered, small, ovate, tetragonal, two-leaved. Brazil, 1838. Intermediate. Syn. *Maxillaria citrina, Promenæa citrina* (W. O. A. i. 7).

Z. Clayi (Clay's).* *fl.* freely produced; sepals and petals deep purplish-brown, margined, banded, and sometimes blotched, with green; lip deep violet-purple, with darker purple lines, paler at the edges, 1½in. wide, the ruff whitish, with bluish-violet plaits; scapes radical. 1876. A beautiful hybrid between *Z. crinitum* and *Z. maxillare.* Intermediate. (F. M. n. s. 267; W. O. A. 50.)

Z. cochleare (spoon-like). *fl.* white, about 1in. long; sepals and petals ovate, pointed; lip blue-variegated, somewhat quadrate-cordate, emarginate at the broadly rounded summit, crested at the base by a broadly reniform, longitudinally many-plaited callus; peduncles 3in. long, one-flowered. *l.* oblong, acute, tapering at the base, 6in. to 10in. long. West Indies. Stove. (B. M. 3585; B. R. 1857.)

Z. cœleste (sky-blue).* *fl.* 3in. to 4in. across; sepals and the shorter petals light blue at base, deeper mauve in the middle, the marginal tips white; lip deep violet in front, the prominent basal callus yellowish-white; column deep purple-blue, yellow at base; scapes 1½ft. to 1½ft. high. June and July. *l.* close-set, cuneate-oblong. Columbia, 1878. Closely allied to *Z. Lalindei.* Greenhouse. Syn. *Bollea cœlestis* (B. H. 1879, 9; B. M. 6458; R. G. 1075).

Z. crinitum (hairy).* *fl.* large, beautifully variegated; sepals and petals green, barred with brown, oblong-lanceolate; lip white or cream-coloured, streaked with coloured, densely hairy veins, broad-obovate, emarginate; callus yellow, small, incurved; spikes sometimes two from a pseudo-bulb. *l.* lorate-lanceolate, plicate, shorter than the scapes. Pseudo-bulbs ovate. Brazil, 1829. Greenhouse. (L. B. C. 1687.) Syns. *Z. Mackayi crinitum* (B. M. 3402), *Z. stenochilum* (L. B. C. 1923). "The best variety is that called *cæruleum*, which has the veins of a deep, bright blue. There is another form with the veins pink" (B. S. Williams).

Z. Dayanum (Day's).* *fl.* similar in shape to those of *Z. cerinum;* sepals and petals milky-white, the former tipped with green, oblong-obovate, the latter roundish-rhomboidal; lip white, clawed, emarginate, with a purplish-violet ruff, the base, as well as the rays in front of the callus, purplish-violet; column yellow, with a broad, reddish band at base. New Grenada, 1873. Stove. Syn. *Pescatorea Dayana.* The following varieties are described by B. S. Williams, in the "Orchid Grower's Manual":

Z. D. candidulum (whitish). *fl.*, sepals and petals pure white, lip tinted with purplish-crimson. (G. C. n. s., iii., p. 343, under name of *Pescatorea Dayana candidula.*)

Z. D. rhodacrum (red-tipped). *fl.*, sepals and petals tipped with purplish-rose. (B. M. 6214, under name of *Pescatorea Dayana rhodacra.*)

Z. D. splendens (splendid). *fl.*, sepals and petals blotched at the tips with dark violet; lip deep violet, which colour extends to the base of the column.

Z. discolor (discoloured). *fl.*, sepals and petals straw-coloured, tinged with purple, 1½in. to 1¾in. long, the lower sepals straight, deflexed, the upper erect, forming with the petals an arch over the column and lip; lip deep velvety-purple, white at base, concave, slightly trilobed, with a yellow, roundish-oblong appendage divided at the edge into strong, diverging teeth, five of which terminate so many distinct ribs. Central America. Syns. *Warrea discolor* (B. M. 4830; L. & P. F. G. i., p. 73), *Warscewiczella discolor* (R. X. O. 93).

Z. Dormanianum (Dorman's). *fl.* white, with some light sulphur on the crest, narrower than in *Z. Klabochorum* and *Z. Lehmanni* (which this plant resembles); lip with a continuous row of angles on the hind margin of the side lobes, and three prolonged, connate, median keels; column sagittate at base. Columbia (?), 1881. Intermediate. Syn. *Pescatorea Dormaniana.*

Z. euglossa (beautiful-lipped). *fl.* of a beautiful lilac colour, similar to those of *Z. Roëzlii*, but with a shorter lip and a broader callus, the tip of the lip bent underneath, ending in two diverging lobes. Ecuador, 1877. Syn. *Pescatorea euglossa.*

Z. expansum (expanded). *fl.*, sepals green, acute; petals brown in the upper part, blotched with brown in the lower, broader than the sepals; lip green, with five interrupted, brown stripes on the basal half, and similar-coloured blotches at the base of the front part, which is fringed. *l.* Grass-like, cuneate-oblong-ligulate, acute. Ecuador (?), 1878.

Z. fimbriatum (fringed). *fl.* about 2in. across; sepals and petals white in the lower and purple in the apical half, elliptic-oblong, acute; lip yellowish-white, with rosy dots, revolute and irregularly fringed on the margins; crest semicircular, composed of seventeen to nineteen dark purple ridges; peduncles short, one-flowered. Columbia, 1880. Intermediate. Syn. *Pescatorea fimbriata* (R. G. 1008).

Z. Gairianum (Gair's).* *fl.* large; sepals and petals deep violet, oblong-ligulate, the anterior part deep black-purple within; lip purplish-rose or light purple-mauve, the front part reflexed on

Zygopetalum—*continued.*

the limb, so as to be nearly hood-shaped, marked by obscure, longitudinal keels, with numerous warts between; ruff of fifteen to seventeen radiating keels, in some forms orange with purple ridges; column dark violet above, whitish-yellow with some purple spots at the base. Ecuador, 1879. Stove. SYN. *Pescatorea Gairiana.*

Z. Gautieri (Gautier's).* *fl.* large; sepals and petals green, blotched and barred with brown, oblong, acute: lip deep purplish-blue, lighter at the edge, the ruff around the column large, and of a deep velvety-purple; racemes drooping, on scapes springing up in the midst of the young leaf-tufts. *l.* elongated-oblong, dark green, plaited. Pseudo-bulbs oblong, deeply furrowed. Brazil, 1868. Greenhouse. (W. O. A. i. 28.) The colour of the lip varies in several varieties from pale mauve (I. H. 1867, 535) to deep bluish-purple.

Z. gemma (gem). *fl.* of a very pale colour, not much exceeding in size those of *Z. sanguinolentum;* lip marked with numerous dark blotches, denticulate and crisped. New Grenada, 1874. A small species. Intermediate. SYN. *Kefersteinia gemma.*

Z. gramineum (grass-like). *fl.* dirty yellow, copiously brown-spotted; petals rather narrower than the sepals; lip broadly oval, gibbous at base beneath, concave in the centre above, the upper half suddenly bending downwards and emarginate at apex, the edge minutely denticulate; scapes three to five, clustered. *l.* about 9in. long, erect or spreading, lanceolate. Pseudo-bulbs none. Popayan, 1857. Intermediate. SYN. *Kefersteinia graminea* (B. M. 5046; R. X. O. 25, ii.)

Z. intermedium (intermediate), of Loddiges. *fl.*, sepals and petals green, tinged with brown, oblong, acute; lip blue, streaked with deep purple, downy-pubescent, large, flat, roundish, bilobed, undulated. Autumn. *l.* ensiform, shorter than the raceme. Brazil, 1844. Reichenbach regards this as a variety of *Z. Mackayi.* Greenhouse. SYN. *Z. velutinum.*

Z. Klabochorum (Klaboch's).* *fl.* 3in. to 3½in. across; sepals oblong, obtuse; petals shorter, cuneate; both white, deeply tipped with chocolate-purple; lip ochre or white, covered with lines of purple-tipped papillæ, trowel-shaped, three-lobed; ruff of nineteen lamellæ, sulphur-coloured, with brown keels; column yellowish, washed with brown and purple. Ecuador, 1879. Intermediate. SYN. *Pescatorea Klabochorum* (I. H. ser. iii. 231; L. & P. F. G., re-issue, 21; W. O. A. i. 17). Of this free-flowering species several varieties have been observed.

Z. K. burfordiensis (Burford).* *fl.* with broader and darker lamellæ on the callus, the broad, middle line of the front part of the lip dark reddish-violet, the whole surface covered with styliform processes. 1879.

Z. K. ornatissimum (very ornamental). A fine variety, with very dark mauve-purple tips, and numerous similar spots at the base, of the petals, and a single spot at the base of the odd sepal. 1884.

Z. lacteum (milk-white). *fl.* white, with a few brownish dots and streaks at the base, small; sepals and petals oblong, acute; lip very broad, cuneate-oblong, retuse; callus depressed, bifid at apex; column dilated in the middle, sometimes angled; peduncles one-flowered. *l.* exceedingly stout, cuneate-oblong, acute. Chiriqui, 1872. Intermediate. SYN. *Kefersteinia lactea.*

Z. Lalindei (Lalind's). *fl.* about 3in. across; sepals and petals lilac at base, pale rose above, or the flowers sometimes bright violet, the upper sepal tipped with green, and the lower part of the lateral ones brownish-purple; lip golden or orange-yellow, with about thirteen close-set lamellæ; column rose-coloured, arched, broader than the lamellate disk; scapes solitary. *l.* elliptic-lanceolate, narrowing to the base, 1ft. long, distichous, five-nerved. New Grenada, 1874. Intermediate. SYN. *Bollea Lalindei* (B. M. 6331).

Z. lamellosum (lamellate). *fl.* 2½in. across, on stout, solitary peduncles 3in. long; sepals and petals yellowish-green, the dorsal sepal elliptic, acute, the lateral one larger, oblong, the petals spathulate; lip yellowish-white, nearly orbicular, cordate at base, the crest orange and brown, much raised, formed of close-set, concentric plates. August. *l.* 1ft. long, narrow-lanceolate, acuminate, narrowed to the base, five-ribbed. Pseudo-bulbs none. Columbia, 1875. Plant densely tufted. Stove. SYN. *Pescatorea lamellosa* (B. M. 6240).

Z. Lawrenceanum (Lawrence's). *fl.* white, solitary, on axillary scapes, 3½in. to 4in. across; sepals and petals blotched with violet or mauve at the tips; lip much shorter than the other parts, nearly square, the sides revolute, the apex of an intense, rich, velvety purple, the basal callus bright yellow, white on each side, large; column white, conspicuous, hooded. *l.* distichous, broadly ligulate, acuminate, keeled. Columbia, 1878. Intermediate. (R. X. O. iii. 221.) SYN. *Bollea Lawrenceana.*

Z. Lehmanni (Lehmann's). *fl.* solitary, axillary, 3in. to 3½in. across, very showy; sepals and petals white, closely lined with reddish-purple, broadly cuneate-oblong; lip deep mauve-purple, the anterior part oblong, revolute, retuse, covered with long, bristle-like, purplish papillæ, the callus of about eleven chestnut-brown ridges. *l.* linear-lorate, acute, 1ft. to 1½ft. high, about 1in. across. Ecuador. Stove. SYN. *Pescatorea Lehmanni* (G. C. n. s., xvii., p. 45; I. H. ser. iii. 471; W. O. A. ii. 57.)

Z. leopardinum (leopard-spotted). *fl.*, sepals and petals light greenish-yellow, spotted with brown; lip with a transverse,

Zygopetalum—*continued.*

obtuse-angled, cordate blade of a beautiful mauve-purple, and an ochreous callus with thirteen teeth. 1886. Garden hybrid. Intermediate.

Z. Mackayi (Mackay's).* *fl.* large, five or six in a raceme; sepals and petals yellowish-green, blotched with brownish-purple, lanceolate; lip white, lined and spotted with purplish-blue, large, roundish, undulated, emarginate, horizontally spreading, the ruff white, striped with blue, large and convex; scape radical, 1½ft. long. *l.* distichous, linear-lanceolate. Pseudo-bulbs large, ovate, scarred, bearing numerous leaves. Brazil, 1825. Greenhouse. (B. M. 2748; L. B. C. 1664; P. M. B. iii. 97.) SYN. *Eulophia Mackaiana* (B. R. 1433). Of this species there are several varieties.

Z. M. crinitum (hairy). A synonym of *Z. crinitum.*

Z. M. intermedium (intermediate), of gardens. *fl.* of a paler colour than in the type, with a fine, large, expanded lip. *l.* longer. A very distinct plant.

Z. marginatum (margined). *fl.* clear straw-colour, with some purple markings on the nearly square appendix to the lip; lateral sepals abruptly bent back, the upper one erect, all tipped with green; petals rolled back above the middle; lip circular, retuse, the edges bent downwards, the disk yellow, with a slight tubercle; column pure white. *l.* pale green, oblong, acute, flat, 6in. long. Columbia. Allied to *Z. discolor.* Intermediate. SYNS. *Warrea quadrata* (B. M. 4766), *Warscewiczella marginata* (R. X. O. 23, f. 2).

Z. maxillare (jaw-shaped).* *fl.* large and showy; sepals and petals green, transversely blotched and barred with chocolate-brown, ovate-oblong, acute; lip rich bluish-purple, with a large, roundish front lobe and a blunt spur; ruff large, deeper purple, shaped like a horse's hoof, and united to the small, erect lateral lobes of the lip; spikes drooping, on radical scapes. *l.* lanceolate, attenuated at base, nerved. Pseudo-bulbs oblong, furrowed. As many as seventy flowers have been produced by one plant. Greenhouse. (B. iii.; B. M. 3686; L. B. C. 1776; P. M. B. iv. 271; R. G. 1879, 345.)

Z. Meleagris (Meleagris). *fl.* 3in. to 4in. across; sepals and petals tessellated, pale yellow on the basal half and purplish-brown upwards, broad at base, the two lateral sepals folded inwards on the inner margin at base; lip about half as large as the petals, similar but clawed, white, tipped with purplish-brown, and having at the base of the claw a crescent-shaped plate, fringed with long, yellowish hairs; peduncles axillary, one-flowered. June and July. *l.* broadly lanceolate, 1ft. long, distichous. Stem short, erect. Brazil. Stove. SYNS. *Batemannia Meleagris* (R. X. O. 66, figs. i., ii.), *Huntleya Meleagris* (B. iii. 146; B. R. 1839, 14).

Z. M. albido-fulvum (whitish-fulvous). *fl.*, upper half of the sepals and petals fulvous, the lower part white; lip and column white, the former tipped with rosy-carmine, the latter with yellowish-green. *l.* light shining green. Stem none. Roots numerous. Brazil, 1868. Intermediate. SYN. *Huntleya albido-fulva* (I. H. 1868, 556).

Z. micropterum (small-winged). *fl.*, sepals and petals creamy-white or ochre; lip white, with three transverse bars of dull crimson on the disk, and small, purple spots at the base, the front lobes elongated, lanceolate, the two lateral ones minute. Summer. Related to *Z. xanthinum.* Intermediate. SYN. *Promenæa microptera.*

Z. Murrayanum (Murray's). *fl.* many in a raceme; sepals and petals greenish, ovate-lanceolate, acute; lip white, the lateral lobes erect, the middle one reflexed, four times as large, purple-spotted at base, the prominent callus yellow, with five straight, violet-brown lines. *l.* lanceolate, striated. Pseudo bulbs ovate, deeply furrowed. Organ Mountains, 1837. (B. M. 3674.)

Z. mystacinum (moustached). *fl.*, sepals, petals, and blade of the lip yellowish-green; callus and stalk of the lip, and column, white, with purple dots, the blade of the lip broken up into numerous fringes. Otherwise closely resembling *Z. gramineum.* Columbia, 1881. SYN. *Kefersteinia mystacina.*

Z. obtusatum (obtuse). *fl.* disposed in a long raceme; sepals and petals green, with narrow, transverse brown bars, narrow, long, obtuse; lip of a very light violet, with a more purplish, retuse lower callus; bracts obtuse. 1878. This plant is very near *Z. maxillare.*

Z. pallens (pale). *fl.*, sepals and petals light mauve, with greenish-yellow tips, the basal inner borders of the lateral sepals cinnamon-coloured, their lower halves being light yellow; lip light ochre, the orange-coloured callus painted with brownish-purple. 1881. Intermediate. SYN. *Bollea pallens.*

Z. Patinii (Patin's). *fl.* solitary, upwards of 3in. across; dorsal sepal and the oblong, undulated petals rosy-pink, the two lower sepals pink along the upper half, and deep rose along the lower side; lip yellow, short, the disk with a frill of about thirteen lamellæ; column pink, large, convex, arching over the lip; scapes axillary, decurved. *l.* distichous, broadly oblong-ligulate, narrow at base, acute at apex, nerved. New Grenada, 1874. Stove. SYN. *Bollea Patinii* (F. M. ser. ii. 147; G. C. n. s., iii., p. 9).

Z. pentachromum (five-coloured). *fl.*, sepals and petals green,

Zygopetalum—*continued.*

marbled with dark brown; lip white, blotched and lined with mauve, cuneate-obovate; callus or ruff like that of *Z. Mackayi*, with adhering, acute, falcate side lobes. 1825. A hybrid between *Z. Mackayi* and *Z. maxillare*. Greenhouse.

Zygopetalum—*continued.*

in front, and a few parallel ones on the sides; sepals pale greenish or yellowish-white. 1883. SYN. *Warscewiczella picta.*

Z. Rivieri (Riviere's). *fl.* very large, disposed in racemes; sepals and petals green, blotched with light brown; lip white, flabel-

FIG. 259. ZYGOPETALUM SEDENI, showing Habit and detached Inflorescence.

Z. pictum (painted). Much like *Z. discolor*, differing chiefly in the lip, which is rhomboid and crisped, yellowish-white, with numerous, broad, marginal, dark purple lines, brownish basal borders, and a greenish, tablet-like, basal callus, with two teeth lately veined with lilac-rose, and exhaling a perfume similar to that of the Hyacinth. *l.* ensiform, above 1½ft. long. Brazil, 1873. Possibly this may be a large-flowered form of *Z. Mackayi*. (R. H. 1873, 191.)

Zygopetalum—*continued.*

Z. Roëzlii (Roëzl's). *fl.* variable; sepals and petals usually white, beautifully tipped with violet-lilac or purplish-rose, the former oblong, the latter cuneate-obovate; blade of the lip, excepting the callus, of the same showy colours. Ecuador, 1874. Allied to *Z. Dayanum*. Stove. SYN. *Pescatorea Roëzlii*.

Z. Rollissoni (Rollisson's). *fl.*, sepals and petals pale yellow; lip whitish, spotted with crimson, the middle lobe oblong, apiculate, the lateral ones narrow-ovate, acute, resembling two erect bars standing up from the base; scapes deflexed, from the lower axils. Autumn. *l.* oblong-lanceolate, venose. Pseudo-bulbs roundish, compressed, bearing about two leaves at the top and other accessory ones from the base. Brazil, 1843. Intermediate. SYNS. *Maxillaria Rollissoni* (B. R. 1833, 40), *Promenæa Rollissoni*.

Z. rostratum (beaked).* *fl.* 6in. deep; dorsal sepals and two petals whitish at base, then green, marked in the centre with dull brownish-purple, linear-lanceolate, 3in. long; lip nearly 3in. long, ovate, recurved, white, yellowish behind the disk, which bears a small, pale lilac-purple frill or ruff, about ten lines of the same colour radiating from it towards the front; scapes radical, one or two-flowered. *l.* lanceolate, acute, plaited. Rhizome creeping, forming compressed pseudo-bulbs at intervals. This species requires more heat and moisture than any other. Stove. (B. M. 2819; W. O. A. ii. 78.) SYN. *Zygosepalum rostratum* (Ref. B. 106).

Z. Russelianum (Russel's). *fl.* large, freely produced; sepals and petals cream-coloured, tipped with reddish-purple; lip of the same reddish-purple tint, the yellow ruff or callus having fifteen lamellæ with deep crimson-purple angles; column yellowish in front, with a lemon-yellow area at base. Ecuador, 1878. Allied to *Z. Dayanum*. Stove. SYN. *Pescatorea Russeliana*.

Z. sanguinolentum (dark bloody). *fl.* pale straw-coloured or greenish, with dark bloody spots; sepals broadly lanceolate, petals oblong-ovate, both acute; lip cuneate-flabellate, lobulate at apex, undulated, denticulated, the basilar callus dark purple at base, bidentate at apex. *l.* distichous, cuneate-lanceolate, acute, glaucous. Roots adventitious, cylindrical. Caraccas. Intermediate. SYN. *Kefersteinia sanguinolenta* (R. X. O. i. 25, i.).

Z. Sedeni (Seden's).* *fl.* large, in bold racemes; sepals and petals deep purplish brown, evenly bordered with pale green; lip rich bluish-purple, deeper coloured towards the base, and breaking out into forked veins near the margin, broad, emarginate, the ruff bluish-purple, bold. *l.* narrow-lanceolate, plaited. 1874. A hybrid between *Z. Mackayi* and *Z. maxillare*, and much resembling the latter. See Fig. 259, for which we are indebted to Mr. Wm. Bull. (F. M. ser. ii. 417; R. G. 1883, 280.)

Z. stapelioides (Stapelia-like). *fl.*, sepals and petals greenish yellow, transversely barred and spotted with dark purple, roundish-ovate, acute; lip deep purple, oblong, three-lobed, the lateral lobes linear, erect, the terminal one ovate-oblong, hooded at base, the margins paler and cross-barred; peduncles deflexed, two-flowered. July to September. *l.* thin, lanceolate, light green. Pseudo-bulbs small, ovate, tetragonal, one or two-leaved. Brazil, 1843. Intermediate. SYNS. *Maxillaria stapelioides* (B. M. 3877; B. R. 1839, 17), *Promenæa stapelioides*.

Z. stenochilum (narrow-lipped). A synonym of *Z. crinitum*.

Z. triumphans (triumphant).* *fl.* fleshy; sepals and petals snowy-white, blue at apex, the former elliptic, apiculate, the latter narrower, cuneate at base; lip blue-black, with a ligulate claw, oblong-rhomboid, emarginate, minutely papillose in the anterior portion; peduncles thick, terete, 4in. to 6in. long. *l.* few, distichous, Grass-like, lanceolate, acute. New Grenada. Stove. SYN. *Pescatorea triumphans* (R. X. O. i. 11).

Z. velatum (veiled). *fl.* yellowish-white, solitary, fragrant; dorsal sepal and petals broadly ovate, acute, the lateral sepals narrow, all spreading upwards; lip margined with crimson, broad, flat, five-lobed, the disk radiately striated with numerous purple-crimson bars; at the base is a stout callus resembling a semicircular row of five to seven teeth; scape rather stout, shorter than the leaves. *l.* few, oblong-ligulate, acute, 9in. long. New Grenada, 1866. Intermediate. SYN. *Warscewiczella velata* (B. H. 1878, 10, f. 4; B. M. 5582; R. X. O. i. 23, f. 1).

Z. velutinum (velvety). A synonym of *Z. intermedium*.

Z. violaceum (violet). *fl.* of a deep rich violet, tipped with greenish-yellow, melting downwards into white, 2in. to 3in. across; sepals and petals curved in at the points, crisped; lip united to the pouch of the lateral sepals by a short, narrow foot; column large, fleshy, curved at apex. *l.* 8in. to 9in. long, erect, acute, tufted. British Guiana, 1835. Stove. SYNS. *Bollea violacea* (R. X. O. 66, iii.), *Huntleya sessiliflora*, *H. violacea*.

Z. Wailesianum (Wailes'). *fl.* of moderate size, scented like Sweet Peas; sepals and petals white or cream-coloured; lip white, stained along the centre with violet, having at the base a crest of five radiating, violet, finger-like bars, which are free except at their origin. Autumn. *l.* dark, evergreen. Brazil. Stove. (B. H. 1878, 10, f. 1; L. & P. F. G. i., p. 73.) SYNS. *Warrea Wailesiana*, *Warscewiczella Wailesiana*.

Z. Wallisii (Wallis').* *fl.* 3in. across; sepals and petals creamy-white, tipped with bluish-violet, the former oblong, apiculate, the latter rhomboid; lip deeper violet, margined with white, oblong, retuse, furrowed, the ruff of seventeen keels white, tinted in front with purple; column white, banded with dark violet at base; scapes short, axillary, one-flowered. *l.* lorate, acuminate. Ecuador, 1869. Greenhouse. SYN. *Pescatorea Wallisii* (F. d. S. 1828).

Z. Wendlandii (Wendland's). *fl.* 4in. to 5in. across; sepals and petals white, lanceolate, somewhat twisted; lip white, blotched and lined with violet-purple, ovate-cordate, many-lobuled, much undulated at the margins, the ruff of seven to nine violet-purple ribs; peduncles stout, axillary. August and September. *l.* tufted, distichous, oblong-ligulate. Costa Rica. A handsome, bulbless species. Stove. SYN. *Warscewiczella Wendlandii*.

Z. W. discolor (discoloured). *fl.* solitary, deliciously scented; sepals and petals yellowish-green; lip white, with a large, bright violet blotch in the centre, much crisped and minutely lobed at the margin, 1½in. broad; peduncles axillary. *l.* light green. Costa Rica. SYN. *Warscewiczella Wendlandii discolor* (W. O. A. iii. 126).

Z. xanthinum (yellow). *fl.* yellow, deeper-coloured towards the centre; sepals and petals oblong, acute, spreading; lip oblong, three-lobed, the lateral lobes profusely spotted, erect, linear, entire, the middle one bilabiate with the upper lip fleshy and five-toothed; bracts cucullate; scapes ascending, one-flowered. *l.* narrow-lanceolate. Pseudo-bulbs oval, tetragonal. Brazil, 1843. Intermediate. SYNS. *Maxillaria xanthina*, *Promenæa xanthina*.

ZYGOPHYLLEÆ. A natural order of shrubs or herbs, very rarely trees, principally inhabiting the hot and extra-tropical regions of both hemispheres. Flowers white, red, or yellow, rarely blue, hermaphrodite; sepals five, rarely four, generally imbricated; petals five or four, very rarely wanting, hypogynous, free, imbricated, or twisted, rarely valvate; disk convex or depressed, rarely annular, inconspicuous, or wanting; stamens usually double, or rarely treble or equal to, the number of petals, biseriate, the outer opposite the sepals; anthers versatile, longitudinally dehiscing; peduncles usually one or two, springing from the axils of the stipules, ebracteate or rarely bibracteolate, one-flowered. Fruit coriaceous or crustaceous, sometimes septicidal and dividing into two to ten cocci, sometimes a loculicidal capsule. Leaves opposite or alternate from the suppression of one, stipulate, bifoliolate or pinnate, rarely three-foliolate; leaflets entire, dotless, sometimes connate; stipules twin, persistent, sometimes spiny. The wood of *Guaiacum* is very hard, and heavier than water; it is employed by cabinet-makers for the manufacture of objects exposed to weight or friction. The order embraces seventeen genera, and about 100 species. Examples: *Chitonia*, *Guaiacum*, *Zygophyllum*.

ZYGOPHYLLUM (from *zygon*, a yoke, and *phyllon*, a leaf; alluding to the pairs of leaflets). Bean Caper. Including *Fabago* and *Rœpera*. ORD. *Zygophylleæ*. A genus comprising about fifty-four species of small, often prostrate shrubs, under-shrubs, or perennial herbs, all, with one exception, confined to the Old World, and mostly found in Australia and South Africa. Flowers white or red, mostly with a purple or red basilar spot; calyx four or five-parted, imbricated; petals four or five-clawed, imbricated and twisted; stamens eight or ten, longer than the petals; peduncles one-flowered, axillary, solitary or rarely two together. Fruit four or five-angled or four or five-winged, capsular. Leaves opposite; leaflets two, very rarely one, often fleshy; stipules two, often spiny. A selection of the introduced species is here given. They should be grown in a compost of loam, peat, and sand. Except where otherwise stated, all require greenhouse treatment. Propagation may be effected by cuttings, inserted in sand, under a glass; or by seeds, when these are obtainable. *Z. Fabago* grows freely in any sunny spot, in dry, well-drained soil.

Z. album (white-flowered). *fl.* on erect pedicels; petals white, crenate, blunt. October and November. *l.*, leaflets cylindrical, club-shaped, fleshy, cobwebby. Stem procumbent. North Africa, 1779. (S. F. G. 371.)

Z. coccineum (scarlet-flowered). *fl.* on erect pedicels; petals scarlet, acuminated. August. *l.*, leaflets cylindrical, fleshy, smooth. *h.* 1ft. 1823. North Africa and Scinde.

Z. cordifolium (cordate-leaved). *fl.* four or five-cleft; petals yellowish, broad, thrice as long as the calyx; peduncles about as

Zygophyllum—*continued.*

long as the leaves. October. *l.* simple, sessile, mostly sub-cordate at base, some oblique at base, or half-cordate. Stem 1ft. or more high, ash-coloured. South Africa, 1774.

Z. Fabago (Fabago). Syrian Bean-Caper. *fl.* on erect pedicels; petals yellow, but of coppery-brick colour at the base, undivided. July to September. *l.*, leaflets flat, smooth, obovate. Root thick, fleshy, striking deeply into the ground. *h.* 1ft. to 4ft. Syria, Tauria, Persia, Afghanistan, &c. Hardy perennial. SYN. *Fabago major* (S. B. F. G. ser. ii. 226).

Z. fœtidum (fœtid). *fl.*, petals orange-yellow, with a purple spot at base, four times longer than the pubescent calyx; peduncles nodding, ½in. long. June. *l.*, leaflets obovate, obtuse, oblique at base, the larger ones 1in. to 1½in. long; petioles ½in. long. Branches herbaceous. *h.* 2ft. to 4ft. South Africa, 1790. Sub-shrub. *Z. insuave* (B. M. 372) is a mere form of this species, with narrower petals.

Z. fruticulosum (small shrub). *fl.* four-cleft; petals yellow; filaments subulate, without wings. July. *l.*, leaflets obliquely oblong or lanceolate, rarely ovate. Australia, 1820. A low, diffuse or divaricately-branched shrub. SYN. *Rœpera fabagifolia.*

Z. f. bilobum (two-lobed). *l.*, leaflets narrow, continuous with the petiole. SYN. *Rœpera aurantiaca.*

Z. fulvum (fulvous). *fl.*, petals fulvous or yellow, with a red basal blotch, twice as long as the calyx; peduncles ½in. to 1in. long, reflexed after flowering. July. *l.* sessile; leaflets lanceolate-ovate, acute, somewhat narrowed at base, the larger ones ten to twelve lines long, very fleshy. *h.* 3ft. South Africa, 1713. (B. M. 2184, under name of *Z. sessilifolium.*)

Z. insuave (disagreeable). A form of *Z. fœtidum.*

Z. Morgsana (Morgsana). *fl.* nodding, four or five-cleft; petals yellow, obovate, thrice as long as the glabrous calyx; peduncles ½in. to ¾in. long. August. *l.* shortly petiolate, the larger ones

Zygophyllum—*continued.*

1in. to 1½in. long; leaflets obovate, obtuse, sub-oblique at base. Stem terete. *h.* 4ft. South Africa, 1732.

Z. spinosum (spiny). *fl.* five-cleft, nodding; petals yellowish or cream-coloured, red-streaked from base to middle or with a purple spot at base, twice or thrice as long as the calyx; peduncles equalling or exceeding the leaves. July. *l.* sessile; leaflets linear, flat or with the margins slightly revolute, acute, fleshy, four to ten lines long. Branches grey. *h.* 1ft. to 2ft. South Africa, 1830.

ZYGOSEPALUM ROSTRATUM. A synonym of **Zygopetalum rostratum** (which *see*).

ZYGOSTATES (from *zygos*, a yoke, and *statos*, standing; alluding to the two processes which stand out horizontally from the base of the column, and together somewhat resemble a yoke). SYN. *Dactylostyles.* ORD. *Orchideæ.* A small genus (three or four species) of dwarf, epiphytal, stove Orchids, found in Brazil. Flowers small, racemose, on axillary peduncles; sepals sub-equal, free, spreading or reflexed; petals similar or broader; lip continuous with the base of the column, spreading, concave, undivided, with an incurved appendage at base; column arched, semi-terete. Leaves fleshy or coriaceous; sheaths scarcely thickened into pseudo-bulbs. Only one species has been introduced. For culture, *see* **Burlingtonia.**

Z. Greeniana (Green's). *fl.*, sepals oblong, obtuse; petals white, ovate, toothleted; lip white, streaked with green, foveate, rounded; peduncles short, two-flowered. *l.* cuneate-ligulate, trigonal, fleshy, superposed. Pseudo-bulbs minute, somewhat pear-shaped, one-leaved. 1869. A curious little plant.

Plants which have been introduced to cultivation in this country since the publication of the various portions of this Work will be described at the end of the Supplement.

DATES OF PUBLICATION.

THE DICTIONARY OF GARDENING having been first issued in the form of Monthly Parts, it is necessary to give here the extent of each part, and the date of its publication. This Table will be found useful in determining the first adoption of a new name, and for other purposes. In several instances, Plants will be found described under their correct names for the first time in any horticultural work.

A	to	Allium	March, 1884	Cleisostoma	to	Corylus	October, 1884
Allium	„	Apple	April, „	Corylus	„	Dahlia	November, „
Apple	„	Aubergine	May, „	Dahlia	„	Dipladenia	December, „
Aubrietia	„	Black Fly	June, „	Dipladenia	„	Eritrichium	January, 1885
Black Fly	„	Caleana	July, „	Eritrichium	„	Freycinetia	February, „
Caleana	„	Celosia	August, „	Freycinetia	„	Gleichenia	March, „
Celosia	„	Cleft	September, „	Gleichenia	„	Hedera	April, „

Dates of Publication—*continued.*

Hedera	to	Hypericum	May,	1885
Hypericum	,,	Karatas	June,	,,
Karatas	,,	Leucoium	July,	,,
Leucoium	,,	Lychnis	August,	,,
Lychnis	,,	Melasphærula	September,	,,
Melasphærula	,,	Mormodes	October,	,,
Mormodes	,,	Nectarine	November,	,,
Nectarine	,,	Oak Galls	December,	,,
Oak Galls	,,	Orange	January,	1886
Orange	,,	Ozothamnus	February,	,,
Pachidendron	,,	Pea	March,	,,
Pea	,,	Peronospora	April,	,,
Peronospora	,,	Phytophthora	May,	,,
Phytophthora	,,	Pleione	June,	,,
Pleios	,,	Populus	July,	,,
Populus	to	Pteris	August,	1886
Pteris	,,	Red Lychnis	September,	,,
Red Maggot	,,	Rosa	October,	,,
Rosa	,,	Sarcochilus	November,	,,
Sarcochilus	,,	Seaside Grounds	December,	,,
Seaside Grounds	,,	Skimmia	January,	1887
Skimmia	,,	Sprengelia	February,	,,
Sprengelia	,,	Strychnos	March,	,,
Strychnos	,,	Thelebolus	April,	,,
Thelebolus	,,	Tradescantia	May,	,,
Tradescantia	,,	Tulipa	June,	,,
Tulipa	,,	Verbena	July,	,,
Verbena	,,	Viscum	August,	,,
Viscum	,,	Xerotes	September,	,,
Xerotes	,,	Zygostates	October,	,,

Supplement to the

DICTIONARY OF GARDENING.

SUPPLEMENT

TO

THE DICTIONARY OF GARDENING.

PREFACE.

THE main object of this Supplement to the DICTIONARY OF GARDENING is to treat in collective groups the plants that have already been dealt with and described individually. Although the alphabetical arrangement of the Dictionary admits of ready reference to any one genus, yet, when the gardener, whether amateur or professional, is called upon to plant a Shrubbery or Rockery, to furnish a Greenhouse or Conservatory, or to select a plant for any particular purpose, he often needs some further assistance. The Supplement will, it is hoped, provide this. In addition, it contains other information of a useful character, much of which is not, so far as we are aware, to be found in any other work on Horticulture. The following are the principal divisions of the Supplement:

Described Genera and their Authors. It has been thought desirable to give an alphabetical list of all the Genera described, together with their Authorities, as the latter have been omitted in the body of the work except in some cases of duplicated generic names.

Pronouncing Dictionary of Ordinal, Generic, and Specific Names. Mispronunciation of Latin and Greek words is, unfortunately, an error of too frequent occurrence amongst horticulturists of all classes: and it is hoped that this division of the Supplement will tend to remedy the evil, and to make pronunciation more uniform than it is.

Herbaceous Plants for Special Purposes. Under this heading are given selections of plants suitable for a variety of purposes, with abbreviated information as to colours of flowers, &c.

Colours of Flowers. This is a somewhat rough classification of the prevailing or ground Colours of the Flowers of herbaceous plants, but it is believed that it will be of great assistance to gardeners who aim at obtaining harmony of colour in floral effects, or who require blossoms of certain hues for any special object.

Shrubs. These are arranged under two divisions, "Deciduous" and "Evergreen," with abbreviated information as to colours of flowers or variegation of leaves. This will be useful when arranging Shrubberies, and even for the ornamental planting of small gardens.

Periods of Flowering. Under each month are given the names of plants then in blossom, together with heights and the colours of the flowers. The value of such information will be readily understood by all who have at any time endeavoured to add to their collections plants which blossom at certain seasons.

Heights of Herbaceous Plants (Hardy and Half-hardy). Arranged under two headings, "Flowering" and "Foliage," and in order of height, this portion of the Supplement will be useful when selecting plants for particular situations. By its help subjects for groups, edgings, and other purposes, may be expeditiously chosen, without fear that on the plants attaining maturity any one species or variety may over-top others to which it was intended that it should be subordinate.

Ferns and Lycopods, Cacti and other Succulents, Bulbous Plants, and Orchids. These are classified according to degrees of hardiness, as a guide to the planting of gardens or the furnishing of houses.

Trees and Shrubs for Special Situations and Soils. These lists will be serviceable to persons laying out plantations, parks, and landscape gardens.

Newly-introduced Plants. The publication of this work in parts has extended over nearly four years, and many plants have been introduced to our gardens since the earlier sheets were printed. These are described in the Supplement, thus bringing the Dictionary up to date.

Animals Beneficial or Injurious to Horticulture. Alphabetical lists of Insects and other Animals mentioned in the body of the work are given, the useful being separated from the Hurtful species for the guidance of gardeners in the extirpation of pests.

It will be easily comprehended that in a First Edition of such matter as this, abundant opportunity is afforded for errors of omission to occur, and in some cases—notably in such divisions as Colours, Periods of Flowering, and Heights of Plants—the information given may be at variance with the experience of the reader; but the Publisher will cordially welcome any corrections for use in future editions.

DESCRIBED GENERA AND THEIR AUTHORS.

IN order to prevent, as far as possible, any misconception as to the identity of garden plants, &c., a list of all the Genera described in this work, with their Authors, is here presented. The frequent duplication in botanical nomenclature will be noticed by any reader who has the DICTIONARY OF GARDENING in frequent use — *e.g.*, the *Reinwardtias* of Dumortier, Blume, and Korthals, and the *Renealmias* of Linnæus, Linnæus, jun., Houttuyn, and R. Brown — and to many amateur gardeners who are anxious to acquire a knowledge of Systematic Botany, this becomes a source of no little confusion.

Bentham and Hooker's "Genera Plantarum" has, for the most part, been taken as the standard of generic limitation in the compilation of this work, at least, so far as Phanerogamous Plants are concerned: in the Ferns, Hooker and Baker's "Synopsis Filicum" has been followed. In several instances, however, it has been thought desirable, for horticultural purposes, to place certain sections of genera under separate headings; *e.g.*, *Amygdalus*, *Azalea*, and *Ligularia*, are included, by Bentham and Hooker, under *Prunus*, *Rhododendron*, and *Senecio*, respectively, but in this work they have been accorded generic rank.

Abelia, R. Brown.
Abies, Jussieu.
Abobra, Naudin.
Abroma, Jacquin.
Abronia, Jussieu.
Abrus, Linnæus.
Abuta, Aublet.
Abutilon, Gærtner.
Acacia, Willdenow.
Acæna, Linnæus.
Acalypha, Linnæus.
Acanthophippium, Blume.
Acantholimon, Boissier.
Acanthophœnix, Wendland.
Acanthorhiza, Wendland.
Acanthostachys, Link, Klotzsch, and Otto.
Acanthus, Linnæus.
Acer, Linnæus.
Aceras, R. Brown.
Ceratium, De Candolle.
Achillea, Linnæus.
Achimenes, P. Browne.
Acineta, Lindley.
Aciotis, Don.
Aciphylla, Forster.
Acis, Salisbury.
Acisanthera, P. Browne.
Acmadenia, Bartling and Wendland.
Acmena, De Candolle.
Aconitum, Linnæus.
Acorus, Linnæus.
Acradenia, Kippist.
Acridocarpus, Guillemin and Perrottet.
Acriopsis, Reinwardt.
Acroclinium, Asa Gray.
Acrocomia, Martius.
Acronychia, Forster.
Acrophyllum, Bentham.
Acrostichum, Linnæus.
Acrotriche, R. Brown.
Actæa, Linnæus.
Actinella, Nuttall.
Actinidia, Lindley.
Actiniopteris, Link.
Actinocarpus, R. Brown.
Actinomeris, Nuttall.
Actinotus, Labillardière.
Ada, Lindley.
Adamia, Wallich.
Adansonia, Linnæus.
Adelobotrys, De Candolle.
Adenandra, Willdenow.
Adenanthera, Linnæus.
Adenanthos, Labillardière.
Adenium, Römer and Schultes.
Adenocalymna, Martius.
Adenocarpus, De Candolle.
Adenophora, Fischer.
Adenostoma, Hooker and Arnott.
Adesmia, De Candolle.
Adhatoda, Nees.
Adiantum, Linnæus.

Genera and their Authors—*continued.*

Adina, Salisbury.
Adlumia, Rafinesque.
Adonis, Linnæus.
Æchmea, Ruiz and Pavon.
Ægiceras, Gærtner.
Ægiphila, Jacquin.
Ægle, Correa.
Æolanthus, Martius.
Aeranthus, Lindley.
Aerides, Loureiro.
Æschynanthus, Jack.
Æschynomene, Linnæus.
Æsculus, Linnæus.
Æthionema, Brown.
Afzelia, Smith.
Agalmyla, Blume.
Aganisia, Lindley.
Aganosma, G. Don.
Agapanthus, L'Héritier.
Agapetes, G. Don.
Agaricus, Linnæus.
Agastachys, R. Brown.
Agathæa, Cassini.
Agathophyllum, Jussieu.
Agathosma, Willdenow.
Agati, Desvaux.
Agave, Linnæus.
Ageratum, Linnæus.
Aglaia, Loureiro.
Aglaonema, Schott.
Agrimonia, Linnæus.
Agrostemma, Linnæus.
Agrostis, Linnæus.
Ailantus, Desfontaines.
Ainsliæa, De Candolle.
Aira, Linnæus.
Aitonia, Linnæus, jun.
Aizoon, Linnæus.
Ajuga, Linnæus.
Akebia, Decaisne.
Alangium, La Marck.
Albizzia, Durazzini.
Albuca, Linnæus.
Alchemilla, Linnæus.
Aletris, Linnæus.
Aleurites, Forster.
Alhagi, Desvaux.
Alibertia, Achille Richard.
Alisma, Linnæus.
Allamanda, Linnæus.
Allantodia, Wallich.
Allium, Linnæus.
Alloplectus, Martius.
Almeidea, St. Hilaire.
Alnus, Gærtner.
Alocasia, Schott.
Aloe, Linnæus.
Alomia, Humboldt, Bonpland, and Kunth.
Alona, Lindley.
Alonsoa, Ruiz and Pavon.
Aloysia, Ortega.
Alpinia, Linnæus.
Alsodeia, Thouars.
Alsophila, Brown.
Alstonia, R. Brown.
Alströmeria, Linnæus.
Alternanthera, Forskahl.
Althæa, Linnæus.
Alyssum, Linnæus.
Amarantus, Linnæus.
Amaryllis, Linnæus.
Amasonia, Linnæus, jun.
Ambrosinia, Linnæus.
Amelanchier, Lindley.
Amellus, Linnæus.
Amerimnon, P. Browne.
Amherstia, Wallich.
Amicia, Humboldt, Bonpland, and Kunth.
Ammobium, R. Brown.
Ammodendron, Fischer.
Amomum, Linnæus.
Amorpha, Linnæus.
Amorphophallus, Blume.
Ampelopsis, Michaux.
Amphicarpæa, Elliott.
Amphicome, Royle.
Amphilophium, Kunth.
Amsonia, Walter.
Amygdalus, Linnæus.
Amyris, Linnæus.
Anacampseros, Linnæus.
Anacardium, Rottboell.
Anagallis, Linnæus.
Anagyris, Linnæus.
Ananas, Adanson.
Anantherix, Nuttall.
Anarrhinum, Desfontaines.
Anastatica, Linnæus.
Anchietea, St. Hilaire.
Anchomanes, Schott.
Anchusa, Linnæus.
Andersonia, R. Brown.
Andira, La Marck.
Androcymbium, Willdenow.
Androlepis, Brongniart.
Andromeda, Linnæus.
Andropogon, Linnæus.
Androsace, Linnæus.
Androstephium, Torrey.
Andryala, Linnæus.
Aneilema, R. Brown.
Anemia, Swartz.
Anemone, Linnæus.
Anemonopsis, Siebold and Zuccarini.
Anemopægma, Martius.
Anethum, Linnæus.
Angelica, Linnæus.
Angelonia, Humboldt and Bonpland.
Angiopteris, Smith.
Angophora, Cavanilles.
Angræcum, Thouars.
Anguloa, Ruiz and Pavon.
Anguria, Linnæus.
Anigozanthos, Labillardière.
Anisochilus, Wallich.
Anisomeles, R. Brown.
Anœctochilus, Blume
Anomatheca, Ker.
Anona, Linnæus.
Anopterus, Labillardière.
Ansellia, Lindley.
Antennaria, Gærtner.
Anthemis, Linnæus.
Anthericum, Linnæus.
Anthocercis, Labillardière.
Antholoma, Labillardière.
Antholyza, Linnæus.
Anthospermum, Linnæus.
Anthoxanthum, Linnæus.
Anthurium, Schott.
Anthyllis, Linnæus.
Antiaris, Leschenault.
Antigonon, Endlicher.
Antirrhinum, Linnæus.
Antrophyum, Kaulfuss.
Aotus, Smith.
Apeiba, Aublet.
Aphelandra, R. Brown.
Aphelexis, Bojer.
Aphyllanthes, Linnæus.
Apicra, Willdenow.
Apios, Mœnch.
Apium, Linnæus.
Aplectrum, Nuttall.
Apocynum, Linnæus.
Aponogeton, Thunberg.
Aquilegia, Linnæus.
Arabis, Linnæus.
Arachis, Linnæus.
Aralia, Linnæus.
Araucaria, Jussieu.
Arbutus, Linnæus.
Arctostaphylos, Adanson.
Arctotheca, Wendland.
Arctotis, Linnæus.
Ardisia, Swartz.
Arduina, Linnæus.
Areca, Linnæus.
Arenaria, Linnæus.
Arenga, Labillardière.
Arethusa, Linnæus.
Argania, Römer and Schultes.
Argemone, Linnæus.
Argyreia, Loureiro.
Argyroxyphium, De Candolle.
Arisæma, Martius.
Arisarum, Targioni Tozzetti.
Aristea, Aiton.
Aristolochia, Linnæus.
Aristotelia, L'Héritier.
Armeniaca, Jussieu.
Armeria, Willdenow.
Arnebia, Forskahl.
Arnica, Linnæus.
Arpophyllum, Llave.
Arracacha, De Candolle.
Artabotrys, R. Brown.
Artanema, Don.
Artemisia, Linnæus.
Arthropodium, R. Brown.
Arthrostemma, Ruiz and Pavon.
Artocarpus, Forster.
Arum, Linnæus.
Arundinaria, Michaux.
Arundo, Linnæus.
Asarum, Linnæus.
Asclepias, Linnæus.
Ascyrum, Linnæus.
Asimina, Adanson.
Aspalathus, Linnæus.
Asparagus, Linnæus.
Aspasia, Lindley.
Asperula, Linnæus.
Asphodeline, Reichenbach.
Asphodelus, Linnæus.
Aspidistra, Ker.
Aspidium, Swartz and R. Brown.
Asplenium, Linnæus.
Assonia, Cavanilles.
Astartea, De Candolle.
Astelma, R. Brown.
Astephanus, R. Brown.
Aster, Linnæus.
Asteracantha, Nees.
Astilbe, Hamilton.
Astragalus, Linnæus.
Astrantia, Linnæus.

Genera and their Authors—*continued.*

Astrapæa, Lindley.
Astrocaryum, G. W. Meyer.
Astroloma, R. Brown.
Asystasia, Blume.
Atalantia, Correa.
Athamanta, Linnæus.
Athanasia, Linnæus.
Atherosperma, Labillardière.
Athrixia, Ker.
Athrotaxis, Don.
Atragene, Linnæus.
Atriplex, Linnæus.
Atropa, Linnæus.
Attalea, Humboldt, Bonpland, and Kunth.
Aubrietia, Adanson.
Aucuba, Thunberg.
Audouinia, Brongniart.
Aulax, Bergius.
Avena, Linnæus.
Averrhoa, Linnæus.
Azalea, Linnæus.
Azara, Ruiz and Pavon.

Babiana, Ker.
Babingtonia, Lindley.
Baccharis, Linnæus.
Backhousia, Hooker and Harvey.
Bactris, Jacquin.
Bacularia, F. Mueller.
Bæa, Commerson.
Bæckea, Linnæus.
Bæria, Fischer and Meyer.
Bahia, Lagasca.
Balbisia, Cavanilles.
Balsamodendron, Kunth.
Bambusa, Schreber.
Banisteria, Linnæus.
Banksia, Linnæus, jun.
Baphia, Afzelius.
Baptisia, Ventenat.
Barbacenia, Vandelli.
Barbarea, Brown.
Barbieria, De Candolle.
Barkeria, Knowles and Westcott.
Barklya, F. Mueller.
Barleria, Linnæus.
Barnadesia, Mutis.
Barosma, Willdenow.
Barringtonia, Forster.
Bartonia, Sims.
Basella, Linnæus.
Bassia, Linnæus.
Batatas, Choisy.
Bauemannia, Lindley.
Bauera, Banks.
Bauhinia, Linnæus.
Beaucarnea, Lemaire.
Beaufortia, R. Brown.
Beaumontia, Wallich.
Bedfordia, De Candolle.
Befaria, Mutis.
Begonia, Linnæus.
Bellevalia, Lapeyrouse.
Bellidiastrum, Micheli.
Bellis, Linnæus.
Bellium, Linnæus.
Beloperone, Nees.
Benthamia, Lindley.
Berardia, Villars.
Berberidopsis, J. D. Hooker.
Berberis, Linnæus.

Berchemia, Necker.
Bergera, Kœnig.
Berkheya, Ehrhart.
Bertholletia, Humboldt and Bonpland
Bertolonia, Raddi.
Berzelia, Brongniart.
Beschorneria, Kunth.
Besleria, Linnæus.
Bessera, Schultz.
Beta, Linnæus.
Betula, Linnæus.
Biarum, Schott.
Bidens, Linnæus.
Biebersteinia, Stephan.
Bifrenaria, Lindley.
Bigelovia, De Candolle.
Bignonia, Linnæus.
Billardiera, Smith.
Billbergia, Thunberg.
Biophytum, De Candolle.
Biscutella, Linnæus.
Bivonæa, De Candolle.
Bixa, Linnæus.
Blæria, Linnæus.
Blakea, Linnæus.
Blandfordia, Smith.
Blechnum, Linnæus.
Blechum, P. Browne.
Blepharis, Jussieu.
Blephilia, Rafinesque.
Bletia, Ruiz and Pavon.
Blumenbachia, Schrader.
Bobartia, Ker.
Bocconia, Linnæus.
Bœbera, Willdenow.
Bœhmeria, Jacquin.
Boletus, Dillenius.
Boleum, Desvaux.
Boltonia, L'Héritier.
Bomarea, Mirbel.
Bombax, Linnæus.
Bonatea, Willdenow.
Bongardia, C. A. Meyer.
Bonnaya, Link and Otto.
Bonnetia, Martius and Zuccarini.
Borago, Linnæus.
Borassus, Linnæus.
Borbonia, Linnæus.
Boronia, Smith.
Borreria, G. F. W. Meyer.
Boscia, La Marck.
Bossiæa, Ventenat.
Boswellia, Roxburgh.
Botrychium, Swartz.
Boucerosia, Wight and Arnott.
Bouchea, Chamisso.
Bougainvillea, Spach.
Boussingaultia, Humboldt, Bonpland, and Kunth.
Bouvardia, Salisbury.
Bowenia, Hooker.
Bowiea, Harvey.
Brabeium, Linnæus.
Brachychiton, Schott.
Brachycome, Cassini.
Brachylæna, R. Brown.
Brachyotum, Triana.
Brachysema, R. Brown.
Brachyspatha, Schott.
Brachystelma, R. Brown.
Brahea, Martius.
Brainea, Hooker.
Brassavola, R. Brown.

Brassia, R. Brown.
Brassica, Linnæus.
Bravoa, Llave.
Bredia, Blume.
Brexia, Thouars.
Brillantaisia, Palisot de Beauvois.
Briza, Linnæus.
Brodiæa, Smith.
Bromelia, Linnæus.
Bromheadia, Lindley.
Bromus, Linnæus.
Brongniartia, Humboldt, Bonpland, and Kunth.
Brosimum, Swartz.
Broughtonia, R. Brown.
Broussonetia, Ventenat.
Browallia, Linnæus.
Brownea, Jacquin.
Brownlowia, Roxburgh.
Brucea, Miller.
Brunfelsia, Linnæus.
Brunia, Linnæus.
Brunonia, Smith.
Brunsvigia, Heister.
Brya, P. Browne.
Bryanthus, Gmelin.
Bryonia, Linnæus.
Bryophyllum, Salisbury.
Bucklandia, Brown.
Buddleia, Linnæus.
Buettneria, Linnæus.
Bulbine, Linnæus.
Bulbocodium, Linnæus.
Bulbophyllum, Thouars.
Bunchosia, L. C. Richard.
Buphthalmum, Linnæus.
Bupleurum, Linnæus.
Burbidgea, J. D. Hooker.
Burchardia, R. Brown.
Burchellia, R. Brown.
Burlingtonia, Lindley.
Bursaria, Cavanilles.
Bursera, Linnæus.
Burtonia, R. Brown.
Butea, Roxburgh.
Butomus, Linnæus.
Buxus, Linnæus.
Byrsonima, L. C. Richard.
Bystropogon, L'Héritier.

Cabomba, Aublet.
Cacalia, Linnæus.
Cacoucia, Aublet.
Cæsalpinia, Linnæus.
Cajanus, De Candolle.
Cakile, Gærtner.
Caladenia, R. Brown.
Caladium, Ventenat.
Calamagrostis, Adanson.
Calamintha, Mœnch.
Calamus, Linnæus.
Calandrinia, Humboldt, Bonpland, and Kunth.
Calanthe, R. Brown.
Calathea, G. F. W. Meyer.
Calceolaria, Linnæus.
Caldcluvia, Don.
Calea, Linnæus.
Caleana, R. Brown.
Calectasia, R. Brown.
Calendula, Linnæus.
Caliphruria, Herbert.

Genera and their Authors—*continued.*

Calla, Linnæus.
Calliandra, Bentham.
Callicarpa, Linnæus.
Callichroa, Fischer and Meyer.
Callicoma, Andrews.
Calligonum, Linnæus.
Calliprora, Lindley.
Callipsyche, Herbert.
Callipteris, Bory.
Callirhoe, Nuttall.
Callistemon, R. Brown.
Callistephus, Cassini.
Callitris, Ventenat.
Calluna, Salisbury.
Calochilus, R. Brown.
Calochortus, Pursh.
Calodendron, Thunberg.
Calophaca, Fischer.
Calophanes, Don.
Calophyllum, Linnæus.
Calopogon, R. Brown.
Caloscordum, Herbert.
Calostemma, R. Brown.
Calothamnus, Labillardière.
Calotis, R. Brown.
Calotropis, R. Brown.
Caltha, Linnæus.
Calycanthus, Linnæus.
Calycophyllum, De Candolle.
Calycotome, Link.
Calypso, Salisbury.
Calyptranthes, Swartz.
Calyptrocalyx, Blume.
Calyptrogyne, H. Wendland.
Calystegia, R. Brown.
Calythrix, Labillardière.
Camaridium, Lindley.
Camassia, Lindley.
Cambessedesia, De Candolle.
Camellia, Linnæus.
Camoensia, Welwitsch.
Campanea, Decaisne.
Campanula, Linnæus.
Campanumæa, Blume.
Camphora, Nees.
Campsidium, Seemann.
Camptopus, J. D. Hooker.
Canarina, Linnæus.
Canarium, Linnæus.
Canavalia, Adanson.
Canbia, Parry.
Candollea, Labillardière.
Canella, Swartz.
Canistrum, Morren.
Canna, Linnæus.
Cannabis, Linnæus.
Canscora, La Marck.
Cantua, Jussieu.
Capparis, Linnæus.
Capsicum, Linnæus.
Caragana, La Marck.
Caraguata, Lindley.
Carallia, Roxburgh.
Caralluma, R. Brown.
Carapa, Aublet.
Cardamine, Linnæus.
Cardiandra, Siebold and Zuccarini.
Carduncellus, Adanson.
Carduus, Linnæus.
Carex, Linnæus.
Careya, Roxburgh.
Carica, Linnæus.
Carissa, Linnæus.
Carlina, Linnæus.
Carludovica, Ruiz and Pavon.
Carmichælia, R. Brown.
Carpenteria, Torrey.
Carpinus, Linnæus.
Carpodinus, R. Brown.
Carpolyza, Salisbury.
Carthamus, Linnæus.
Carum, Linnæus.
Carya, Nuttall.
Caryocar, Linnæus.
Caryophyllus, Linnæus.
Caryopteris, Bunge.
Caryota, Linnæus.
Casearia, Jacquin.
Casimiroa, Llave.
Cassandra, Don.
Cassebeera, Kaulfuss.
Cassia, Linnæus.
Cassine, Linnæus.
Cassinia, R. Brown.
Cassiope, Don.
Castanea, Gærtner.
Castanospermum, Allan Cunningham.
Castilleja, Linnæus, jun.
Castilloa, Cervantes.
Casuarina, Forster.
Catalpa, Jussieu.
Catananche, Linnæus.
Catasetum, L. C. Richard.
Catesbæa, Linnæus.
Catha, Forskahl.
Cathcartia, J. D. Hooker.
Catoblastus, H. Wendland.
Catopsis, Grisebach.
Cattleya, Lindley.
Caulophyllum, Michaux.
Ceanothus, Linnæus.
Cecropia, Linnæus.
Cedrela, Linnæus.
Cedronella, Mœnch.
Cedrus, Loudon.
Celastrus, Linnæus.
Celosia, Linnæus.
Celsia, Linnæus.
Celtis, Linnæus.
Centaurea, Linnæus.
Centotheca, Desvaux.
Centradenia, G. Don.
Centranthus, De Candolle.
Centronia, Don.
Centropogon, Presl.
Centrosolenia, Bentham.
Cephaelis, Swartz.
Cephalanthera, L. C. Richard.
Cephalanthus, Linnæus.
Cephalaria, Schrader.
Cephalotaxus, Siebold and Zuccarini.
Cephalotus, Labillardière.
Cerastium, Linnæus.
Cerasus, Jussieu.
Ceratiola, Michaux.
Ceratolobus, Blume.
Ceratonia, Linnæus.
Ceratopetalum, Smith.
Ceratopteris, Brongniart.
Ceratostema, Jussieu.
Ceratozamia, Brongniart.
Cerbera, Linnæus.
Cercis, Linnæus.
Cercocarpus, Humboldt, Bonpland, and Kunth.
Cereus, Haworth.
Cerinthe, Linnæus.
Ceropegia, Linnæus.
Ceroxylon, Humboldt and Bonpland.
Cespedesia, Goudot.
Cestrum, Linnæus.
Chænostoma, Bentham.
Chærophyllum, Linnæus.
Chætanthera, Ruiz and Pavon.
Chætocalyx, De Candolle.
Chætogastra, Naudin.
Chamæbatia, Bentham.
Chamæcyparis, Spach.
Chamædorea, Willdenow.
Chamælaucium, Desfontaines.
Chamæpeuce, De Candolle.
Chamæranthemum, Nees.
Chamærhodos, Bunge.
Chamærops, Linnæus.
Chamissoa, Humboldt, Bonpland, and Kunth.
Chaptalia, Ventenat.
Charieis, Cassini.
Chascanum, E. Meyer.
Cheilanthes, Swartz.
Cheiranthus, Linnæus.
Cheirostemon, Humboldt and Bonpland.
Cheirostylis, Blume.
Chelidonium, Linnæus.
Chelone, Linnæus.
Chenopodium, Linnæus.
Chilopsis, Don.
Chimaphila, Pursh.
Chimonanthus, Lindley.
Chiococca, Linnæus.
Chionanthus, Linnæus.
Chionodoxa, Boissier.
Chionographis, Maximowicz.
Chirita, Hamilton.
Chironia, Linnæus.
Chlidanthus, Herbert.
Chloanthes, R. Brown.
Chlora, Linnæus.
Chloris, Swartz.
Chlorogalum, Kunth.
Chlorophytum, Ker.
Chlorospatha, Endlicher.
Chloroxylon, De Candolle.
Choisya, Kunth.
Chomelia, Jacquin.
Chondrorhyncha, Lindley.
Chorispora, De Candolle.
Chorizema, Labillardière.
Chrysalidocarpus, H. Wendland.
Chrysanthemum, Linnæus.
Chrysobactron, J. D. Hooker.
Chrysobalanus, Linnæus.
Chrysocoma, Linnæus.
Chrysogonum, Linnæus.
Chrysophyllum, Linnæus.
Chrysopsis, Nuttall.
Chrysosplenium, Linnæus.
Chysis, Lindley.
Cicca, Linnæus.
Cichorium, Linnæus.
Cienkowskia, Solms.
Cimicifuga, Linnæus.
Cinchona, Linnæus.
Cineraria, Linnæus.
Cinnamodendron, Endlicher.
Cinnamomum, Blume.
Cipura, Aublet.
Circæa, Linnæus.

Genera and their Authors—*continued.*

Cirrhæa, Lindley.
Cirrhopetalum, Lindley.
Cissampelos, Linnæus.
Cissus, Linnæus.
Cistus, Linnæus.
Citharexylum, Linnæus.
Citrullus, Schrader.
Citrus, Linnæus.
Cladrastis, Rafinesque.
Clarkia, Pursh.
Clausena, Burmann.
Clavija, Ruiz and Pavon.
Claytonia, Linnæus.
Cleisostoma, Blume.
Clematis, Linnæus.
Cleome, Linnæus.
Clerodendron, Linnæus.
Clethra, Linnæus.
Cleyera, De Candolle.
Clianthus, Solander.
Clidemia, Don.
Clintonia, Rafinesque.
Clitoria, Linnæus.
Clivia, Lindley.
Clowesia, Lindley.
Clusia, Linnæus.
Cluytia, Linnæus.
Cneorum, Linnæus.
Cnestis, Jussieu.
Cnicus, Linnæus.
Cobæa, Cavanilles.
Coccocypselum, P. Browne.
Coccoloba, Linnæus.
Cocculus, De Candolle.
Cochlearia, Linnæus.
Cochliostema, Lemaire.
Cochlospermum, Kunth.
Cocos, Linnæus.
Codiæum, Rumphius.
Codonopsis, Wallich.
Cœlestina, Cassini.
Cœlia, Lindley.
Cœliopsis, Reichenbach, jun.
Cœlogyne, Lindley.
Coffea, Linnæus.
Coix, Linnæus.
Cola, Schott.
Colchicum, Linnæus.
Coldenia, Linnæus.
Colea, Bojer.
Colebrookia, Smith.
Coleonema, Bartling and Wendland.
Coleus, Loureiro.
Colletia, Commerson.
Collinsia, Nuttall.
Collinsonia, Linnæus.
Collomia, Nuttall.
Colocasia, Schott.
Cologania, Kunth.
Colquhounia, Wallich.
Colubrina, L. C. Richard.
Columellia, Ruiz and Pavon.
Columnea, Linnæus.
Coluria, Brown.
Colutea, Linnæus.
Comaropsis, L. C. Richard.
Comarostaphylis, Zuccarini.
Comarum, Linnæus.
Combretum, Linnæus.
Comesperma, Labillardière.
Commelina, Linnæus.
Comocladia, P. Browne.
Comparettia, Pœppig.
Comptonia, Banks.
Conandron, Siebold and Zuccarini.
Conanthera, Ruiz and Pavon.
Conium, Linnæus.
Connarus, Linnæus.
Conocarpus, Gærtner.
Conospermum, Smith.
Conostegia, Don.
Conostephium, Bentham.
Convallaria, Linnæus.
Convolvulus, Linnæus.
Conyza, Lessing.
Cookia, Sonnerat.
Cooperia, Herbert.
Copaifera, Linnæus.
Copernicia, Martius.
Coprosma, Forster.
Coptis, Salisbury.
Corchorus, Linnæus.
Cordia, Linnæus.
Cordyline, Commerson.
Corema, Don.
Coreopsis, Linnæus.
Corethrostylis, Endlicher.
Coriandrum, Linnæus.
Coriaria, Linnæus.
Coris, Linnæus.
Cornus, Linnæus.
Cornutia, Linnæus.
Corokia, Allan Cunningham.
Coronilla, Linnæus.
Correa, Smith.
Cortusa, Linnæus.
Coryanthes, Hooker.
Corydalis, De Candolle.
Corylopsis, Siebold and Zuccarini.
Corylus, Linnæus.
Corynocarpus, Forster.
Corynophallus, Schott.
Corynostylis, Martius.
Corypha, Linnæus.
Corysanthes, R. Brown.
Coscinium, Colebrooke.
Cosmanthus, Nolte.
Cosmelia, R. Brown.
Cosmibuena, Ruiz and Pavon.
Cosmos, Cavanilles.
Cossignia, Commerson.
Costus, Linnæus.
Cotoneaster, Medikus.
Cotyledon, Linnæus.
Coulteria, Humboldt, Bonpland, and Kunth.
Couroupita, Aublet.
Coursetia, De Candolle.
Cousinia, Cassini.
Coutarea, Aublet.
Coutoubea, Aublet.
Cowania, Don.
Crambe, Linnæus.
Crassula, Linnæus.
Cratægus, Linnæus.
Cratæva, Linnæus.
Crawfurdia, Wallich.
Crepis, Linnæus.
Crescentia, Linnæus.
Crinum, Linnæus.
Cristaria, Cavanilles.
Crithmum, Linnæus.
Crocosmia, Planchon.
Crocus, Linnæus.
Crossandra, Salisbury.
Crotalaria, Linnæus.
Croton, Linnæus.
Crowea, Smith.
Crucianella, Linnæus.
Cryptanthus, Otto and Dietrich.
Cryptochilus, Wallich.
Cryptocoryne, Fischer.
Cryptogramme, R. Brown.
Cryptomeria, Don.
Cryptostegia, R. Brown.
Cryptostemma, R. Brown.
Cucumis, Linnæus.
Cucurbita, Linnæus.
Culcasia, Palisot de Beauvois.
Cunila, Linnæus.
Cunninghamia, R. Brown.
Cunonia, Linnæus.
Cupania, Linnæus.
Cuphea, P. Browne.
Cupressus, Linnæus.
Curatella, Linnæus.
Curculigo, Gærtner.
Curcuma, Linnæus.
Curtisia, Aiton.
Cuscuta, Linnæus.
Cussonia, Thunberg.
Cyananthus, Wallich.
Cyanella, Linnæus.
Cyanophyllum, Naudin.
Cyanotis, Don.
Cyathea, Smith.
Cyathodes, Labillardière.
Cycas, Linnæus.
Cyclamen, Linnæus.
Cycnoches, Lindley.
Cydonia, Tournefort.
Cylista, Aiton.
Cymbidium, Swartz.
Cynanchum, Linnæus.
Cynara, Linnæus.
Cynoglossum, Linnæus.
Cynometra, Linnæus.
Cypella, Herbert.
Cyperus, Linnæus.
Cyphia, Bergius.
Cyphokentia, Brongniart.
Cyphomandra, Sendtner.
Cyphosperma, H. Wendland.
Cypripedium, Linnæus.
Cyrilla, Garden.
Cyrtanthera, Nees.
Cyrtanthus, Aiton.
Cyrtoceras, Bennett.
Cyrtochilum, Humboldt, Bonpland, and Kunth.
Cyrtopodium, R. Brown.
Cyrtostachys, Blume.
Cystacanthus, T. Anderson.
Cystopteris, Bernhardi.
Cytisus, Linnæus.

Dabœcia, Don.
Dacrydium, Solander.
Dactylis, Linnæus.
Dactyloctenium, Willdenow.
Dæmia, R. Brown.
Dæmonorops, Blume.
Dahlia, Cavanilles.
Dais, Linnæus.
Dalbergia, Linnæus, jun.
Dalea, Linnæus.
Dalechampia, Linnæus.
Dalibarda, Linnæus.

Genera and their Authors—*continued.*

Dammara, Lambert.
Damnacanthus, Gærtner.
Dampiera, R. Brown.
Danæa, Smith.
Daphne, Linnæus.
Darlingtonia, Torrey.
Darwinia, Rudge.
Dasylirion, Zuccarini.
Datisca, Linnæus.
Datura, Linnæus.
Daubenya, Lindley.
Daucus, Linnæus.
Davallia, Smith.
Davidsonia, Mueller.
Daviesia, Smith.
Decabelone, Decaisne.
Decaisnea, J. D. Hooker and Thomson.
Decumaria, Linnæus.
Deherainia, Decaisne.
Delabechia, Lindley.
Delarbrea, Vieillard.
Delima, Linnæus.
Delostoma, Don.
Delphinium, Linnæus.
Dendrobium, Swartz.
Dendrochilum, Blume.
Dendromecon, Bentham.
Dendropanax, Decaisne.
Dendroseris, Don.
Dentaria, Linnæus.
Deparia, Hooker and Greville.
Deppea, Chamisso and Schlechtendahl.
Desfontainea, Ruiz and Pavon.
Desmanthus, Willdenow.
Desmodium, Desvaux.
Desmoncus, Martius.
Deutzia, Thunberg.
Diacalpe, Blume.
Dianella, La Marck.
Dianthera, Linnæus.
Dianthus, Linnæus.
Diapensia, Linnæus.
Diascia, Link and Otto.
Dicentra, Borkhausen.
Dichæa, Lindley.
Dichorisandra, Mikan.
Dichrostachys, De Candolle.
Dichrotrichum, Reinwardt.
Dicksonia, L'Héritier.
Dicliptera, Jussieu.
Dictamnus, Linnæus.
Dictyanthus, Decaisne.
Dictyosperma, H. Wendland.
Dictyoxiphium, Hooker.
Dicyrta, Regel.
Didymocarpus, Wallich.
Didymochlæna, Desvaux.
Didymosperma, H. Wendland and Drude.
Dieffenbachia, Schott.
Diervilla, Tournefort.
Digitalis, Linnæus.
Dilatris, Bergius.
Dillenia, Linnæus.
Dillwynia, Smith.
Dimorphanthus, Miquel.
Dimorphotheca, Mœnch.
Dionæa, Ellis.
Dioon, Lindley.
Dioscorea, Linnæus.
Diosma, Linnæus.
Diospyros, Linnæus.
Diotis, Desfontaines.
Dipcadi, Medikus.
Diphylleia, Michaux.
Diphysa, Jacquin.
Diplacus, Nuttall.
Dipladenia, Alphonse de Candolle.
Diplolæna, Brown.
Diplothemium, Martius.
Dipsacus, Linnæus.
Dipteryx, Schreber.
Dirca, Linnæus.
Disa, Bergius.
Discaria, Hooker.
Dischidia, R. Brown.
Disocactus, Pfeiffer.
Disporum, Salisbury.
Disteganthus, Lemaire.
Distylium, Siebold and Zuccarini.
Diuris, Smith.
Dodecatheon, Linnæus.
Dolichos, Linnæus.
Doliocarpus, Roland.
Dombeya, La Marck.
Doodia, R. Brown.
Dorema, Don.
Doronicum, Linnæus.
Dorstenia, Linnæus.
Doryanthes, Correa da Serra.
Dorycnium, Villars.
Dossinia, Morren.
Douglasia, Lindley.
Downingia, Torrey.
Draba, Linnæus.
Dracæna, Linnæus.
Dracocephalum, Linnæus.
Dracontium, Linnæus.
Dracophyllum, Labillardière.
Dracunculus, Schott.
Drakæa, Lindley.
Drepanocarpus, G. A. F. W. Meyer.
Drimia, Jacquin.
Drimiopsis, Lindley.
Drimys, Forster.
Drosera, Linnæus.
Drosophyllum, Link.
Dryandra, R. Brown.
Dryas, Linnæus.
Drymoda, Lindley.
Drymoglossum, Presl.
Drymonia, Martius.
Drymophlœus, Zippel.
Dryobalanops, Gærtner.
Drypetes, Vahl.
Drypis, Linnæus.
Duboisia, R. Brown.
Dumasia, De Candolle.
Duranta, Linnæus.
Durio, Linnæus.
Duvalia, Haworth.
Duvaua, Kunth.
Dyckia, Schultes.
Dypsis, Noronha.
Dysodia, Cavanilles.

Earina, Lindley.
Ebenus, Linnæus.
Ebermaiera, Nees.
Ecballium, L. C. Richard.
Eccremocarpus, Ruiz and Pavon.
Echidnium, Schott.
Echidnopsis, J. D. Hooker.
Echinacea, Mœnch.
Echinocactus, Link and Otto.
Echinops, Linnæus.
Echinopsis, Zuccarini.
Echinospermum, Swartz.
Echites, Linnæus.
Echium, Linnæus.
Edgeworthia, Meissner.
Ehretia, Linnæus.
Eichhornia, Kunth.
Ekebergia, Sparrmann.
Elæagnus, Linnæus.
Elæis, Jacquin.
Elæocarpus, Linnæus.
Elæodendron, Jacquin, jun.
Elettaria, Maton.
Eleusine, Gærtner.
Elisena, Herbert.
Elleanthus, Presl.
Elliottia, Muhlenberg.
Elodea, Michaux.
Elymus, Linnæus.
Embelia, Jussieu.
Embothrium, Forster.
Emmenanthe, Bentham.
Empetrum, Linnæus.
Empleurum, Solander.
Encephalartos, Lehmann.
Enkianthus, Loureiro.
Entada, Adanson.
Entelea, Brown.
Eomecon, Hance.
Epacris, Cavanilles.
Ephedra, Linnæus.
Epidendrum, Linnæus.
Epigæa, Linnæus.
Epilobium, Linnæus.
Epimedium, Linnæus.
Epipactis, R. Brown.
Epiphyllum, Pfeiffer.
Epipremnum, Schott.
Episcia, Martius.
Epistephium, Kunth.
Equisetum, Linnæus.
Eragrostis, Palisot de Beauvois.
Eranthemum, Linnæus.
Eranthis, Salisbury.
Ercilla, Adrien de Jussieu.
Eremia, Don.
Eremostachys, Bunge.
Eremurus, Bieberstein.
Eria, Lindley.
Erianthus, Michaux.
Erica, Linnæus.
Ericinella, Klotzsch.
Erigeron, Linnæus.
Erinus, Linnæus.
Eriocaulon, Linnæus.
Eriochilus, R. Brown.
Eriocnema, Naudin.
Eriodendron, De Candolle.
Eriogonum, Michaux.
Eriophorum, Linnæus.
Eriophyllum, Lagasca.
Eriopsis, Lindley.
Eriosema, De Candolle.
Eriospermum, Jacquin.
Eriostemon, Smith.
Erithalis, Linnæus.
Eritrichium, Schrader.
Erodium, L'Héritier.
Eryngium, Linnæus.
Erysimum, Linnæus.
Erythea, S. Watson.
Erythræa, L. C. Richard.

Genera and their Authors—*continued.*

Erythrina, Linnæus.
Erythrochiton, Nees and Martius.
Erythronium, Linnæus.
Erythrophlœum, Afzelius.
Erythroxylon, Linnæus.
Escallonia, Linnæus, jun.
Eschscholtzia, Chamisso.
Espeletia. Humboldt and Bonpland.
Euadenia, Oliver.
Eucalyptus, L'Héritier.
Euchætis, Bartling and Wendland.
Eucharidium, Fischer and Meyer.
Eucharis, Planchon.
Euchlæna, Schrader.
Euclea, Linnæus.
Eucomis, L'Héritier.
Eucrosia, Ker.
Eucryphia, Cavanilles.
Eugenia, Linnæus.
Eulalia, Trinius.
Eulophia, R. Brown.
Eunomia, De Candolle.
Euonymus, Linnæus.
Eupatorium, Linnæus.
Euphorbia, Linnæus.
Euphrasia, Linnæus.
Eupomatia, R. Brown.
Eurya, Thunberg.
Euryale, Salisbury.
Eurycles, Salisbury.
Eurygania, Klotzsch.
Euscaphis, Siebold and Zuccarini.
Eustegia, R. Brown.
Eustoma, Salisbury.
Eustrephus, R. Brown.
Eutaxia, R. Brown.
Euterpe, Gærtner.
Evolvulus, Linnæus.
Exacum, Linnæus.
Exochorda, Lindley.
Exostemma, L. C. Richard.
Eysenhardtia, Humboldt, Bonpland, and Kunth.

Faba, Tournefort.
Fabiana, Ruiz and Pavon.
Fadyenia, Hooker.
Fagelia, Necker.
Fagopyrum, Gærtner.
Fagræa, Thunberg.
Fagus, Linnæus.
Falkia, Linnæus, jun.
Fallugia, Endlicher.
Faramea, Aublet.
Farsetia, Desvaux.
Fatsia, Decaisne and Planchon.
Fedia, Mœnch.
Felicia, Cassini.
Fernandezia, Lindley.
Fernelia, Commerson.
Feronia, Correa.
Ferraria, Linnæus.
Ferula, Linnæus.
Festuca, Linnæus.
Fevillea, Linnæus.
Ficus, Linnæus.
Fieldia, Allan Cunningham.
Fischeria, De Candolle.
Fittonia, E. Coëmans.
Fitzroya, J. D. Hooker.
Flacourtia, Commerson.
Flaveria, Jussieu.
Flindersia, Brown.
Fluggea, Willdenow.
Fœniculum, Adanson.
Fœtidia, Commerson.
Fontanesia, Labillardière.
Forrestia, A. Richard.
Forsythia, Vahl.
Fothergilla, Linnæus.
Fouquiera, Humboldt, Bonpland, and Kunth.
Fragaria, Linnæus.
Francoa, Cavanilles.
Frankenia, Linnæus.
Frasera, Walter.
Fraxinus, Linnæus.
Freesia, Klatt.
Fremontia, Torrey.
Freycinetia, Gaudichaud.
Freziera, Swartz.
Friesia, De Candolle.
Fritillaria, Linnæus.
Frœlichia, Mœnch.
Fuchsia, Linnæus.
Fugosia, Jussieu.
Fumana, Dunal.
Fumaria, Linnæus.
Funkia, Sprengel.
Furcræa, Ventenat.

Gærtnera, La Marck.
Gagea, Salisbury.
Gagnebina, De Candolle.
Gaillardia, Fougère.
Galactites, Mœnch.
Galactodendron, Humboldt, Bonpland, and Kunth.
Galanthus, Linnæus.
Galax, Linnæus.
Galaxia, Thunberg.
Galeandra, Lindley.
Galega, Linnæus.
Galeola, Loureiro.
Galeopsis, Linnæus.
Galipea, Aublet.
Galium, Linnæus.
Galphimia, Cavanilles.
Galtonia, Decaisne.
Garcinia, Linnæus.
Gardenia, Linnæus.
Gardoquia, Ruiz and Pavon.
Garrya, Douglas.
Garuga, Roxburgh.
Gasteria, Duval.
Gastonia, Commerson.
Gastrodia, R. Brown.
Gastrolobium, R. Brown.
Gaudichaudia, Humboldt, Bonpland, and Kunth.
Gaultheria, Linnæus.
Gaura, Linnæus.
Gaussia, H. Wendland.
Gaylussacia, Humboldt, Bonpland, and Kunth.
Gazania, Gærtner.
Geaster, Persoon.
Geissois, Labillardière.
Geissomeria, Lindley.
Geissorhiza, Ker.
Gelasine, Herbert.
Gelsemium, Jussieu.
Genipa, Linnæus.
Genista, Linnæus.
Gentiana, Linnæus.
Geodorum, Jackson.
Geoffræa, Linnæus.
Geonoma, Willdenow.
Geranium, Linnæus.
Gerardia, Linnæus.
Gesnera, Martius.
Gethyllis, Linnæus.
Geum, Linnæus.
Gilia, Ruiz and Pavon.
Gilibertia, Ruiz and Pavon.
Gillenia, Mœnch.
Gilliesia, Lindley.
Ginkgo, Linnæus.
Gladiolus, Linnæus.
Glaucium, Jussieu.
Glaux, Linnæus.
Gleditschia, Linnæus.
Gleichenia, Smith.
Globba, Linnæus.
Globularia, Linnæus.
Gloriosa, Linnæus.
Glossodia. R. Brown.
Glossula, Lindley.
Gloxinia, L'Héritier.
Glycine, Linnæus.
Glycosmis, Correa.
Glycyrrhiza, Linnæus.
Glyphæa, J. D. Hooker.
Glyphosperma, S. Watson.
Gmelina, Linnæus.
Gnaphalium, Linnæus.
Gnidia, Linnæus.
Godoya, Ruiz and Pavon.
Goethea, Nees and Martius.
Gomphia, Schreber.
Gomphocarpus, R. Brown.
Gompholobium, Smith.
Gomphrena, Linnæus.
Gonatanthus, Klotzsch.
Gongora, Ruiz and Pavon.
Gonocalyx, Planchon and Linden.
Gonolobus, Michaux.
Goodenia, Smith.
Goodia, Salisbury.
Goodyera, R. Brown.
Gordonia, Ellis.
Gossypium, Linnæus.
Gouania, Linnæus.
Govenia, Lindley.
Grabowskia, Schlechtendahl.
Grammangis, Reichenbach, jun.
Grammanthes, De Candolle.
Grammatocarpus, Presl.
Grammatophyllum, Blume.
Graptophyllum, Nees.
Gratiola, Linnæus.
Gravesia, Naudin.
Greigia, Regel.
Grevillea. R. Brown.
Grewia, Linnæus.
Greyia, Hooker and Harvey.
Grias, Linnæus.
Griffinia, Ker.
Grindelia, Willdenow.
Griselinia, Forster.
Grislea, Linnæus.
Grobya, Lindley.
Gronovia, Linnæus.
Guaiacum, Linnæus.
Guarea, Linnæus.
Guatteria, Ruiz and Pavon.
Guazuma, Plumier.

Genera and their Authors—*continued.*

Guettarda, Linnæus.
Guevina, Molina.
Guichenotia, J. Gay.
Guilielma, Martius.
Gundelia, Linnæus.
Gunnera, Linnæus.
Gustavia, Linnæus.
Gutierrezia, Lagasca.
Guzmania, Ruiz and Pavon.
Gymnadenia, R. Brown.
Gymnema, R. Brown.
Gymnocladus, La Marck.
Gymnogramme, Desvaux.
Gymnolomia, Humboldt, Bonpland, and Kunth.
Gymnostachys, R. Brown.
Gymnostachyum, Nees.
Gynandropsis, De Candolle.
Gynerium, Humboldt and Bonpland.
Gynura, Cassini.
Gypsophila, Linnæus.

Habenaria, Willdenow.
Haberlea, Frivaldsky.
Hablitzia, Bieberstein.
Habranthus, Herbert.
Hacquetia, Necker.
Hæmanthus, Linnæus.
Hæmaria, Lindley.
Hæmatoxylon, Linnæus.
Hæmodorum, Smith.
Hakea, Schrader.
Halesia, Linnæus.
Halimodendron, Fischer.
Halleria, Linnæus.
Hallia, Thunberg.
Hamamelis, Linnæus.
Hamelia, Jacquin.
Hamiltonia, Roxburgh.
Hancornia, Gomez.
Haplopappus, Cassini.
Hardenbergia, Bentham.
Hardwickia, Roxburgh.
Haronga, Thouars.
Harpagophytum, De Candolle.
Hartogia, Thunberg.
Hartwegia, Lindley.
Haworthia, Duval.
Hebecladus, Miers.
Hebenstretia, Linnæus.
Hechtia, Klotzsch.
Hedera, Linnæus.
Hedwigia, Swartz.
Hedychium, Kœnig.
Hedysarum, Linnæus.
Hedyscepe, H. Wendland.
Heeria, Schlechtendahl.
Heinsia, De Candolle.
Heisteria, Linnæus.
Helenium, Linnæus.
Heliamphora, Bentham.
Helianthemum, Persoon.
Helianthus, Linnæus.
Helichrysum, Gærtner.
Helicodiceros, Schott.
Heliconia, Linnæus.
Helicteres, Linnæus.
Helinus, E. Meyer.
Heliocarpus, Linnæus.
Heliophila, Linnæus.
Heliopsis, Persoon.
Heliotropium, Linnæus.
Helipterum, De Candolle.
Helleborus, Linnæus.
Helmholtzia, F. Mueller.
Helmia, Kunth.
Helminthostachys, Kaulfuss.
Helonias, Linnæus.
Helwingia, Willdenow.
Hemerocallis, Linnæus.
Hemiandra, R. Brown.
Hemichæna, Bentham.
Hemimeris, Thunberg.
Hemionitis, Linnæus.
Hemiphragma, Wallich.
Hemitelia, Brown.
Heptapleurum, Gærtner.
Heracleum, Linnæus.
Herbertia, Sweet.
Heritiera, Aiton.
Hermannia, Linnæus.
Herminiera, Guillemin and Perrottet.
Herminium, Linnæus.
Hernandia, Linnæus.
Herniaria, Linnæus.
Herpestis, Gærtner, jun.
Herrania, Goudot.
Herreria, Ruiz and Pavon.
Hesperantha, Ker.
Hesperis, Linnæus.
Hessea, Herbert.
Heteranthera, Ruiz and Pavon.
Heteropappus, Lessing.
Heteropterys, Kunth.
Heterospathe, Scheffer.
Heterotheca, Cassini.
Heterotoma, Zuccarini.
Heterotropa, Morren and Decaisne.
Heuchera, Linnæus.
Hevea, Aublet.
Hexaglottis, Ventenat.
Hibbertia, Andrews.
Hibiscus, Linnæus.
Hieracium, Linnæus.
Hierochloe, Gmelin.
Hillia, Jacquin.
Hindsia, Bentham.
Hippeastrum, Herbert.
Hippia, Linnæus.
Hippobromus, Ecklon and Zeyher.
Hippocrepis, Linnæus.
Hippomane, Linnæus.
Hippophae, Linnæus.
Hippuris, Linnæus.
Hodgsonia, Joseph D. Hooker and Thomson.
Hoffmannia, Swartz.
Holbœllia, Wallich.
Holcus, Linnæus.
Holmskioldia, Retz.
Homalanthus, A. Jussieu.
Homalomena, Schott.
Homeria, Ventenat.
Homogyne, Cassini.
Honckenya, Willdenow.
Hoodia, Sweet.
Hordeum, Linnæus.
Horminum, Linnæus.
Horsfieldia, Blume.
Hosackia, Douglas.
Hottonia, Linnæus.
Houlletia, A. Brongniart.
Houstonia, Linnæus.
Houttea, Decaisne.
Houttuynia, Thunberg.
Hovea, R. Brown.
Hovenia, Thunberg.
Howea, Beccari.
Hoya, R. Brown.
Hudsonia, Linnæus.
Huernia, R. Brown.
Humea, Smith.
Humulus, Linnæus.
Hunnemannia, Sweet.
Hura, Linnæus.
Hutchinsia, Brown.
Hyacinthus, Linnæus.
Hybernia, Latreille.
Hydnum, Linnæus.
Hydrangea, Linnæus.
Hydrastis, Linnæus.
Hydriastele, H. Wendland and Drude.
Hydrocharis, Linnæus.
Hydrolea, Linnæus.
Hydropeltis, Michaux.
Hydrophyllum, Linnæus.
Hymenæa, Linnæus.
Hymenandra, Alphonse de Candolle.
Hymenanthera, R. Brown.
Hymenocallis, Salisbury.
Hymenodictyon, Wallich.
Hymenophyllum, Linnæus.
Hyophorbe, Gærtner.
Hyoscyamus, Linnæus.
Hyospathe, Martius.
Hypecoum, Linnæus.
Hypericum, Linnæus.
Hyphæne, Gærtner.
Hypocalymma, Endlicher.
Hypocalyptus, Thunberg.
Hypocyrta, Martius.
Hypoderris, Brown.
Hypoëstes, R. Brown.
Hypolepis, Bernhardi.
Hypolytrum, L. C. Richard.
Hypoxis, Linnæus.
Hyssopus, Linnæus.

Ibbetsonia, Sims.
Iberidella, Boissier.
Iberis, Linnæus.
Icacina, A. Jussieu.
Ichnocarpus, R. Brown.
Idesia, Maximowicz.
Ilex, Linnæus.
Illecebrum, Linnæus.
Illicium, Linnæus.
Imantophyllum, Hooker.
Impatiens, Linnæus.
Incarvillea, Jussieu.
Indigofera, Linnæus.
Inga, Willdenow.
Inocarpus, Forster.
Inula, Linnæus.
Iochroma, Bentham.
Ione, Lindley.
Ionidium, Ventenat.
Ionopsidium, Reichenbach.
Ionopsis, Humboldt, Bonpland, and Kunth.
Iostephane, Bentham.
Ipomœa, Linnæus.
Iresine, Linnæus.
Iriartea, Ruiz and Pavon.
Iris, Linnæus.
Isatis, Linnæus.
Ischarum, Blume.

Genera and their Authors—*continued.*

Isertia, Schreber.
Isochilus, R. Brown.
Isoloma, Bentham.
Isomeris, Nuttall.
Isonandra, Wight.
Isoplexis, Lindley.
Isopogon, R. Brown.
Isopyrum, Linnæus.
Isotoma, Lindley.
Isotropis, Bentham.
Itea, Linnæus.
Ixanthus, Grisebach.
Ixia, Linnæus.
Ixiolirion, Herbert.
Ixodia, R. Brown.
Ixora, Linnæus.

Jaborosa, Jussieu.
Jacaranda, Jussieu.
Jacksonia, R. Brown.
Jacobinia, Moricand.
Jacquemontia, Choisy.
Jacquinia, Linnæus.
Jamesia, Torrey and Gray.
Jamesonia, Hooker and Greville.
Jasione, Linnæus.
Jasminum, Linnæus.
Jateorhiza, Miers.
Jatropha, Linnæus.
Jeffersonia, Barton.
Jerdonia, Wight.
Juanulloa, Ruiz and Pavon.
Jubæa, Humboldt, Bonpland, and Kunth.
Juglans, Linnæus.
Juncus, Linnæus.
Juniperus, Linnæus.
Jurinea, Cassini.
Jussiæa, Linnæus.
Justicia, Linnæus.

Kadsura, Kæmpfer.
Kæmpferia, Linnæus.
Kageneckia, Ruiz and Pavon.
Kalanchoe, Adanson.
Kalmia, Linnæus.
Karatas, Adanson.
Kaulfussia, Blume.
Kennedya, Ventenat.
Kentia, Blume.
Kentiopsis, Brongniart.
Kentrophyllum, Necker.
Keramanthus, J. D. Hooker.
Kerria, De Candolle.
Kielmeyera, Martius.
Kingia, R. Brown.
Kitaibelia, Willdenow.
Kleinhovia, Linnæus.
Klugia, Schlechtendahl.
Knightia, R. Brown.
Kniphofia, Mœnch.
Knowltonia, Salisbury.
Knoxia, Linnæus.
Kœllikeria, Regel.
Koëlreuteria, Laxmann.
Kœniga, Brown.
Kopsia, Blume.
Korthalsia, Blume.
Krameria, Linnæus.
Kreysigia, Reichenbach.
Kuhnia, Linnæus.
Kunzea, Reichenbach.
Kydia, Roxburgh.
Kyllinga, Rottboell.

Labichea, Gaudichaud.
Labisia, Lindley.
Lablab, Adanson.
Laburnum, Grisebach.
Lacæna, Lindley.
Lachenalia, Jacquin.
Lachnæa, Linnæus.
Lachnanthes, Elliott.
Lachnostoma, Humboldt, Bonpland, and Kunth.
Lactuca, Linnæus.
Lælia, Lindley.
Læliopsis, Lindley.
Lafoënsia, Vandelli.
Lagascea, Cavanilles.
Lagenaria, Seringe.
Lagenophora, Cassini.
Lagerströmia, Linnæus.
Lagetta, Jussieu.
Lagunaria, G. Don.
Lagurus, Linnæus.
Lallemantia, Fischer and Meyer.
Lamarckia, Mœnch.
Lambertia, Smith.
Lamium, Linnæus.
Lamourouxia, Humboldt, Bonpland, and Kunth.
Lanaria, Aiton.
Landolphia, Palisot de Beauvois.
Lankesteria, Lindley.
Lantana, Linnæus.
Lapageria, Ruiz and Pavon.
Lapeyrousia, Pourret.
Laplacea, Humboldt, Bonpland, and Kunth.
Laportea, Gaudichaud.
Lardizabala, Ruiz and Pavon.
Larix, Miller.
Larrea, Cavanilles.
Lasiopetalum, Smith.
Lasiospermum, Lagasca.
Lasthenia, Cassini.
Latania, Commerson.
Lathræa, Linnæus.
Lathyrus, Linnæus.
Latua, Philippi,
Laurelia, Jussieu.
Laurentia, Necker.
Laurus, Linnæus.
Lavandula, Linnæus.
Lavatera, Linnæus.
Lavradia, Vellozo.
Lawsonia, Linnæus.
Laxmannia, R. Brown.
Layia, Hooker and Arnott.
Leavenworthia, Torrey.
Lebeckia, Thunberg.
Lecythis, Linnæus.
Ledenbergia, Klotzsch.
Ledum, Linnæus.
Leea, Linnæus.
Leianthus, Grisebach.
Leiochilus, Knowles and Westcott.
Leiophyllum, Persoon.
Lemna, Linnæus.
Lens, Grenier and Godron.
Leonotis, Persoon.
Leontice, Linnæus.
Leontodon, Linnæus.
Leontopodium, R. Brown.
Lepanthes, Swartz.
Lepechinia, Willdenow.
Lepidagathis, Willdenow.
Lepidium, Linnæus.
Leptinella, Cassini.
Leptodermis, Wallich.
Leptomeria, R. Brown.
Leptospermum, Forster.
Leptosyne, De Candolle.
Leschenaultia, R. Brown.
Lespedeza, Michaux.
Lessertia, De Candolle.
Leucadendron, R. Brown.
Leuchtenbergia, Hooker.
Leucocarpus, Don.
Leucocoryne, Lindley.
Leucojum, Linnæus.
Leucopogon, R. Brown.
Leucospermum, R. Brown.
Leucothoë, Don.
Leuzea, De Candolle.
Leviaticum, Koch.
Lewisia, Pursh.
Leycesteria, Wallich.
Leyssera, Linnæus.
Lhotzkya, Schauer.
Liabum, Adanson.
Liatris, Schreber.
Libertia, Sprengel.
Libocedrus, Endlicher.
Libonia, C. Koch.
Licuala, Thunberg.
Lietzia, Regel and Schmidt.
Lightfootia, L'Héritier.
Ligularia, Cassini.
Ligusticum, Linnæus.
Ligustrum, Linnæus.
Lilium, Linnæus.
Limnanthemum, S. P. Gmelin.
Limnanthes, R. Brown.
Limnocharis, Humboldt, Bonpland, and Kunth.
Limonia, Linnæus.
Limoniastrum, Mœnch.
Linaria, Jussieu.
Linconia, Linnæus.
Lindelofia, Lehmann.
Lindenia, Bentham.
Lindera, Thunberg.
Lindheimera, Asa Gray.
Lindleya, Humboldt, Bonpland, and Kunth.
Lindsaya, Dryander.
Linnæa, Gronovius.
Linum, Linnæus.
Liparia, Linnæus.
Liparis (plants), L. C. Richard.
Liparis (insects), Ochsenheimer.
Lippia, Linnæus.
Liquidambar, Linnæus.
Liriodendron, Linnæus.
Liriope, Loureiro.
Lisianthus, Aublet.
Lissanthe, R. Brown.
Lissochilus, R. Brown.
Litanthus, Harvey.
Lithospermum, Linnæus.
Litsea, La Marck.
Littonia, Hooker.
Livistona, R. Brown.
Llavea, Lagasca.

Genera and their Authors—*continued.*

Lloydia, Salisbury.
Loasa, Jussieu.
Lobelia, Linnæus.
Lobostemon, Lehmann.
Lockhartia, Hooker.
Loddigesia, Sims.
Lodoicea, Labillardière.
Lœselia, Linnæus.
Logania, R. Brown.
Loiseleuria, Desvaux.
Lolium, Linnæus.
Lomaria, Willdenow.
Lomatia, R. Brown.
Lomatophyllum, Willdenow.
Lonas, Adanson.
Lonchitis, Linnæus.
Lonchocarpus, Humboldt, Bonpland, and Kunth.
Lonicera, Linnæus.
Lopezia, Cavanilles.
Lophanthus, Bentham.
Lophiola, Ker.
Lophira, Banks.
Lophyrus, Latreille.
Loreya, De Candolle.
Loropetalum, Brown.
Lotus, Linnæus.
Loxococcus, H. Wendland and Drude.
Loxsoma, Brown.
Lucanus, Scopoli.
Luculia, Sweet.
Lucuma, Jussieu.
Ludia, La Marck.
Luffa, Cavanilles.
Luhea, Willdenow.
Luisia, Gaudichaud.
Lunaria, Linnæus.
Lupinus, Linnæus.
Luxemburgia, St. Hilaire.
Luzuriaga, Ruiz and Pavon.
Lycaste, Lindley.
Lychnis, Linnæus.
Lycium, Linnæus.
Lycoperdon, Tournefort.
Lycopersicum, Miller.
Lycopodium, Linnæus.
Lycoris, Herbert.
Lyda, Fabricius.
Lygeum, Linnæus.
Lygodium, Swartz.
Lyonia, Nuttall.
Lyonsia, R. Brown.
Lyperia, Bentham.
Lysimachia, Linnæus.
Lysinema, R. Brown.
Lysionotus, Don.
Lythrum, Linnæus.

Maba, Forster.
Macadamia, F. Mueller.
Machærium, Persoon.
Mackaya, Harvey.
Macleania, Hooker.
Maclura, Nuttall.
Macodes, Blume.
Macradenia, R. Brown.
Macrocnemum, P. Browne.
Macroglossa, Ochsenheimer.
Macromeria, Don.
Macrostylis, Bartling and Wendland.
Macrozamia, Miquel.
Madia, Molina.
Mærua, Forskahl.
Mæsa, Forskahl.
Magnolia, Linnæus.
Mahernia, Linnæus.
Mahurea, Aublet.
Maianthemum, Wiggers.
Mairia, Nees.
Malabaila, Hoffmann.
Malachra, Linnæus.
Malacocarpus, Salm-Dyck.
Malaxis, Swartz.
Malcolmia, Brown.
Malope, Linnæus.
Malortiea, H. Wendland.
Malpighia, Linnæus.
Malva, Linnæus.
Malvastrum, Asa Gray.
Malvaviscus, Dillenius.
Mamestra, Treitschke.
Mammea, Linnæus.
Mammillaria, Haworth.
Mandevilla, Lindley.
Mandragora, Jussieu.
Manettia, Mutis.
Mangifera, Linnæus.
Manicaria, Gærtner.
Manihot, Adanson.
Mantisia, Sims.
Manulea, Linnæus.
Maranta, Linnæus.
Marasmius, Fries.
Marattia, Smith.
Margyricarpus, Ruiz and Pavon.
Marianthus, Hügel.
Marica, Ker.
Marila, Swartz.
Marlea, Roxburgh.
Marrubium, Linnæus.
Marsdenia, R. Brown.
Marshallia, Schreber.
Marsilea, Linnæus.
Martinezia, Ruiz and Pavon.
Martynia, Linnæus.
Mascarenhasia, Alphonse de Candolle.
Masdevallia, Ruiz and Pavon.
Massangea, Morren.
Massonia, Thunberg.
Mathiola, Brown.
Matonia, Brown.
Matricaria, Linnæus.
Maurandya, Ortega.
Mauria, Kunth.
Mauritia, Linnæus, jun.
Maxillaria, Ruiz and Pavon.
Maximiliana, Martius.
Maytenus, Feuillé.
Mazus, Loureiro.
Meconopsis, Viguier.
Medeola, Linnæus.
Medicago, Linnæus.
Medinilla, Gaudichaud.
Megacarpæa, De Candolle.
Megaclinium, Lindley.
Megarrhiza, Torrey and Gray.
Meiracylium, Reichenbach, jun.
Melaleuca, Linnæus.
Melampyrum, Linnæus.
Melanorrhœa, Wallich.
Melanthera, Rohr.
Melanthium, Linnæus.
Melasma, Bergius.
Melasphærula, Ker.
Melastoma, Linnæus.
Melhania, Forskahl.
Melia, Linnæus.
Melianthus, Linnæus.
Melichrus, R. Brown.
Melicocca, Linnæus.
Melicope, Forster.
Melilotus, Jussieu.
Melissa, Linnæus.
Melittis, Linnæus.
Melocactus, Link and Otto.
Melodinus, Forster.
Memecylon, Linnæus.
Meniscium, Schreber.
Menispermum, Linnæus.
Mentha, Linnæus.
Mentzelia, Linnæus.
Menyanthes, Linnæus.
Menziesia, Smith.
Mercurialis, Linnæus.
Merendera, Ramond.
Meriania, Swartz.
Mertensia, Roth.
Merulius, Haller.
Meryta, Forster.
Mesembryanthemum, Linnæus.
Mespilus, Linnæus.
Mesua, Linnæus.
Metrodorea, St. Hilaire.
Metrosideros, Banks.
Metroxylon, Rottboell.
Metternichia, Mikan.
Meum, Jacquin
Michauxia, L'Héritier.
Michelia, Linnæus.
Miconia, Ruiz and Pavon.
Microcachrys, J. D. Hooker.
Microgaster, Latreille.
Microglossa, De Candolle.
Microlicia, Don.
Microloma, R. Brown.
Micromeria, Bentham.
Micromyrtus, Bentham.
Microstylis, Nuttall.
Mikania, Willdenow.
Milla, Cavanilles.
Millettia, Wight and Arnott.
Millingtonia, Linnæus, jun.
Miltonia, Lindley.
Mimetes, Salisbury.
Mimosa, Linnæus.
Mimulus, Linnæus.
Mimusops, Linnæus.
Mirabilis, Linnæus.
Mirbelia, Smith.
Miscanthus, Anderson.
Mitchella, Linnæus.
Mitella, Linnæus.
Mitracarpum, Zuccarini.
Mitraria, Cavanilles.
Mitriostigma, Hochstetter.
Modecca, La Marck.
Modiola, Mœnch.
Mœhringia, Linnæus.
Mohria, Swartz.
Molinia, Schrank.
Molopospermum, Koch.
Moltkia, Lehmann.
Moluccella, Linnæus.
Momordica, Linnæus.
Monanthes, Haworth.
Monarda, Linnæus.
Monardella, Bentham.
Moneses, Salisbury.

Genera and their Authors—*continued.*

Monimia, Thouars.
Monnina, Ruiz and Pavon.
Monochætum, Naudin.
Monochilus, Fischer and Meyer.
Monochoria, Presl.
Monodora, Dunal.
Monogramme, Schrank.
Monolena, Triana.
Monolopia, De Candolle.
Monomeria, Lindley.
Monopanax, Regel.
Monotoca, R. Brown.
Monsonia, Linnæus.
Monstera, Adanson.
Montanoa, Llave and Lexarza.
Montezuma, De Candolle.
Montrichardia, Crüger.
Moquilea, Aublet.
Moræa, Linnæus.
Moricandia, De Candolle.
Morina, Linnæus.
Morinda, Linnæus.
Moringa, Jussieu.
Morisonia, Linnæus.
Mormodes, Lindley.
Moronobea, Aublet.
Morus, Linnæus.
Moscharia, Ruiz and Pavon.
Mucuna, Adanson.
Muehlenbeckia, Meissner.
Muellera, Linnæus.
Mukia, Arnott.
Mundtia, Kunth.
Muntingia, Linnæus.
Muraltia, Necker.
Murraya, Linnæus.
Musa, Linnæus.
Muscari, Miller.
Mussænda, Linnæus.
Musschia, Dumortier.
Mutisia, Linnæus, jun.
Myanthus, Lindley.
Myginda, Linnæus.
Mylocaryum, Willdenow.
Myoporum, Banks and Solander.
Myosotidium, Hooker.
Myosotis, Linnæus.
Myrcia, De Candolle.
Myrica, Linnæus.
Myricaria, Desvaux.
Myriophyllum, Linnæus.
Myristica, Linnæus.
Myrodia, Swartz.
Myrospermum, Jacquin.
Myroxylon, Linnæus, jun.
Myrrhis, Scopoli.
Myrsine, Linnæus.
Myrsiphyllum, Willdenow.
Myrtus, Linnæus.

Nægelia, Regel.
Nama, Linnæus.
Nandina, Thunberg.
Nannorhops, H. Wendland.
Nanodes, Lindley.
Napoleona, Palisot de Beauvois.
Naravelia, De Candolle.
Narcissus, Linnæus.
Nardostachys, De Candolle.
Narthecium, Mœhring.
Nasonia, Lindley.
Nasturtium, Brown.
Nauclea, Linnæus.
Nectandra, Rolander.
Nectaroscordum, Lindley.
Negundo, Mœnch.
Neillia, Don.
Neja, D. Don.
Nelitris, Gærtner.
Nelumbium, Jussieu.
Nemastylis, Nuttall.
Nematanthus, Martius.
Nematus, Leach.
Nemesia, Ventenat.
Nemopanthes, Rafinesque.
Nemophila, Nuttall.
Nenga, H. Wendland.
Nengella, Beccari.
Neottia, Linnæus.
Nepenthes, Linnæus.
Nepeta, Linnæus.
Nephelaphyllum, Blume.
Nephelium, Linnæus.
Nephrodium, L. C. Richard.
Nephrolepis, Schott.
Nephrosperma, Balfour, jun.
Nephthytis, Schott.
Neptunia, Loureiro.
Nerine, Herbert.
Nerium, Linnæus.
Nertera, Banks and Solander.
Nesæa, Commerson.
Neurolæna, R. Brown.
Newbouldia, Seemann.
Nicandra, Adanson.
Nicotiana, Linnæus.
Nierembergia, Ruiz and Pavon.
Nigella, Linnæus.
Nipa, Wurmb.
Niphæa, Lindley.
Nissolia, Jacquin.
Nivenia, R. Brown.
Noctua, Guénée.
Noisettia, Humboldt, Bonpland, and Kunth.
Nolana, Linnæus.
Nolina, Michaux.
Nonnea, Mœnch.
Nopalea, Salm-Dyck.
Norantea, Aublet.
Notelæa, Ventenat.
Nothochlæna, R. Brown.
Nothoscordum, Kunth.
Notospartium, J. D. Hooker.
Notylia, Lindley.
Nuphar, Smith.
Nuttallia, Torrey and Gray.
Nuytsia, R. Brown.
Nyctanthes, Linnæus.
Nyctocalos, Teijsmann.
Nymphæa, Linnæus.
Nyssa, Linnæus.

Oberonia, Lindley.
Ochna, Schreber.
Ochrocarpus, Thouars.
Ochroma, Swartz.
Ochropteris, J. Smith.
Ochrosia, Jussieu.
Ocimum, Linnæus.
Ocotea, Aublet.
Octadesmia, Bentham.
Octomeria, R. Brown.
Odontadenia, Bentham.
Odontoglossum, Humboldt, Bonpland, and Kunth.
Odontospermum, Necker.
Œdera, Linnæus.
Œnocarpus, Martius.
Œnothera, Linnæus.
Oftia, Adanson.
Ohlendorffia, Lehmann.
Oidium, Link.
Olax, Linnæus.
Oldenlandia, Linnæus.
Oldfieldia, Hooker.
Olea, Linnæus.
Oleandra, Cavanilles.
Olearia, Mœnch.
Omphalea, Linnæus.
Omphalodes, Mœnch.
Oncidium, Swartz.
Oncosperma, Blume.
Onobrychis, Gærtner.
Onoclea, Linnæus.
Ononis, Linnæus.
Onopordon, Linnæus.
Onoseris, De Candolle.
Onosma, Linnæus.
Onosmodium, Michaux.
Onychium, Kaulfuss.
Opercularia, Gærtner.
Ophiocaulon, J. D. Hooker.
Ophioglossum, Linnæus.
Ophiopogon, Ker.
Ophrys, Linnæus.
Oplismenus, Palisot de Beauvois.
Opuntia, Miller.
Orania, Zippelius.
Orchestes, Illiger.
Orchis, Linnæus.
Oreodoxa, Willdenow.
Oreopanax, Decaisne and Planchon.
Orgyia, Ochsenheimer.
Origanum, Linnæus.
Ormocarpum, Palisot de Beauvois.
Ormosia, Jackson.
Ornithidium, Salisbury.
Ornithocephalus, Hooker.
Ornithochilus, Wallich.
Ornithogalum, Linnæus.
Ornithoglossum, Salisbury.
Ornithopus, Linnæus.
Orobanche, Linnæus.
Orobus, Linnæus.
Orontium, Linnæus.
Oroxylum, Ventenat.
Orphium, Ernst Meyer.
Orthoceras, R. Brown.
Orthosiphon, Bentham.
Orthrosanthus, Sweet.
Orvala, Linnæus.
Oryza, Linnæus.
Osbeckia, Linnæus.
Osmanthus, Loureiro.
Osmunda, Linnæus.
Ossæa, De Candolle.
Osteospermum, Linnæus.
Ostrya, Scopoli.
Osyris, Linnæus.
Otacanthus, Lindley.
Othera, Thunberg.
Othonna, Linnæus.

Genera and their Authors—*continued.*

Othonnopsis, Jaubert and Spach.
Otiorhynchus, Germar.
Otochilus, Lindley.
Ottelia, Persoon.
Ourisia, Commerson.
Ouvirandra, Thouars.
Oxalis, Linnæus.
Oxyanthus, De Candolle.
Oxybaphus, Vahl.
Oxycoccus, Persoon.
Oxydendron, De Candolle.
Oxylobium, Andrews.
Oxypetalum, R. Brown.
Oxyspora, De Candolle.
Oxystelma, R. Brown.
Oxytropis, De Candolle.
Ozothamnus, Lessing.

Pachira, Aublet.
Pachynema, Brown.
Pachyphyllum, Humboldt, Bonpland, and Kunth.
Pachypodium, Lindley.
Pachyrhizus, L. C. Richard.
Pachysandra, Michaux.
Pachystima, Rafinesque.
Pachystoma, Blume.
Pæderia, Linnæus.
Pæderota, Linnæus.
Pæonia, Linnæus.
Palafoxia, Lagasca.
Palava, Cavanilles.
Paliavana, Vandelli.
Palicourea, Aublet.
Palisota, Reichenbach.
Paliurus, Jussieu.
Pallenis, Cassini.
Palmia, Endlicher.
Palumbina, Reichenbach, jun.
Panax, Linnæus.
Pancratium, Linnæus.
Pandanus, Linnæus, jun.
Panicum, Linnæus.
Papaver, Linnæus.
Papyrus, Willdenow.
Paracaryum, Boissier.
Paradisanthus, Reichenbach, jun.
Paradisia, Mazzucato.
Pardanthus, Ker.
Parinarium, Jussieu.
Paris, Linnæus.
Parkia, R. Brown.
Parkinsonia, Linnæus.
Parmentiera, De Candolle.
Parnassia, Linnæus.
Parochetus, Hamilton.
Paronychia, Jussieu.
Parrotia, C. A. Meyer.
Parrya, Brown.
Parsonsia, R. Brown.
Parthenium, Linnæus.
Pascalia, Ortega.
Paspalum, Linnæus.
Passiflora, Linnæus.
Patagonula, Linnæus.
Patersonia, R. Brown.
Patrinia, Jussieu.
Paullinia, Linnæus.
Paulownia, Siebold and Zuccarini.
Pavetta, Linnæus.
Pavia, Poiret.
Pavonia, Cavanilles.
Pectis, Linnæus.
Pedalium, Linnæus.
Pedicularis, Linnæus.
Pedilanthus, Necker.
Peganum, Linnæus.
Pelargonium, L'Héritier.
Pelecyphora, Ehrenberg.
Pelexia, Lindley.
Peliosanthes, Andrews.
Pellæa, Link and Hooker.
Pellionia, Gaudichaud.
Peltandra, Rafinesque.
Peltaria, Linnæus.
Peltophorum, Vogel.
Peltostigma, Walpers.
Pemphigus, Hartig.
Penæa, Linnæus.
Pennisetum, Persoon.
Pentachæta, Nuttall.
Pentadesma, Sabine.
Pentagonia, Bentham.
Pentapera, Klotzsch.
Pentapetes, Linnæus.
Pentapterygium, Klotzsch.
Pentarhaphia, Lindley.
Pentas, Bentham.
Pentstemon, Mitchell.
Pentzia, Thunberg.
Peperomia, Ruiz and Pavon.
Peplis, Linnæus.
Pereskia, Miller.
Perezia, Lagasca.
Pergularia, Linnæus.
Peridermium, Link.
Perilomia, Humboldt, Bonpland, and Kunth.
Periploca, Linnæus.
Peristeria, Hooker.
Peristrophe, Nees.
Peritoma, De Candolle.
Pernettya, Gaudichaud.
Peronospora, Corda.
Persea, Gærtner, jun.
Persica, Tournefort.
Persoonia, Smith.
Petalacte, Don.
Petalidium, Nees.
Petalostemon, Michaux.
Petasites, Gærtner.
Petiveria, Linnæus.
Petræa, Linnæus.
Petrobium, R. Brown.
Petrophila, R. Brown.
Petteria, Presl.
Petunga, De Candolle.
Petunia, Jussieu.
Peucedanum, Linnæus.
Peumus, Persoon.
Peziza, Dillenius.
Pfaffia, Martius.
Phaca, Linnæus.
Phacelia, Jussieu.
Phaedon, Megerle.
Phædranassa, Herbert.
Phænocoma, Don.
Phænosperma, Munro.
Phaius, Loureiro.
Phalænopsis, Blume.
Phalaris, Linnæus.
Phaleria, Jack.
Pharnaceum, Linnæus.
Pharus, Linnæus.
Phaseolus, Linnæus.
Phebalium, Ventenat.
Phelipæa, Desfontaines.
Philadelphus, Linnæus.
Philageria, Masters.
Philesia, Commerson.
Philibertia, Humboldt, Bonpland, and Kunth.
Phillyrea, Linnæus.
Philodendron, Schott.
Philotheca, Rudge.
Philydrum, Banks.
Phinæa, Bentham.
Phleum, Linnæus.
Phlogacanthus, Nees.
Phlomis, Linnæus.
Phlox, Linnæus.
Phœnix, Linnæus.
Pholidocarpus, Blume.
Pholidota, Lindley.
Phormium, Forster.
Phorodon, Passerini.
Photinia, Lindley.
Phragmidium, Link.
Phratora, Chevrolat.
Phryma, Linnæus.
Phrynium, Willdenow.
Phuopsis, Grisebach.
Phygelius, E. Meyer.
Phylica, Linnæus.
Phyllagathis, Blume.
Phyllanthus, Linnæus.
Phyllarthron, De Candolle.
Phyllis, Linnæus.
Phyllobius, Schönherr.
Phyllocactus, Link.
Phyllocalyx, Bergius.
Phyllocladus, L. C. Richard.
Phyllodoce, Salisbury.
Phyllostachys, Siebold and Zuccarini.
Phyllota, De Candolle.
Phyllotreta, Chevrolat.
Physalis, Linnæus.
Physianthus, Martius.
Physidium, Schrader.
Physochlaina, G. Don.
Physosiphon, Lindley.
Physospermum, Cusson.
Physostegia, Bentham.
Physostelma, Wight.
Physostigma, Balfour.
Physurus, L. C. Richard.
Phytelephas, Ruiz and Pavon.
Phyteuma, Linnæus.
Phytocrene, Wallich.
Phytolacca, Linnæus.
Phytomyza, Fallèn.
Phytophthora, De Bary.
Piaranthus, R. Brown.
Picea, Link.
Picrorhiza, Royle.
Pictetia, De Candolle.
Pieris, Don.
Pigafetta, Beccari.
Pilea, Lindley.
Pileanthus, Labillardière.
Pilocarpus, Vahl.
Pilocereus, Lemaire.
Pilularia, Linnæus.
Pimelea, Banks.

Genera and their Authors—*continued.*

Pimenta, Lindley.
Pimpinella, Linnæus.
Pinanga, Blume.
Pinckneya, L. C. Richard.
Pinellia, Tenore.
Pinguicula, Linnæus.
Pinus, Linnæus.
Pionea, Guénée.
Piophila, Fallèn.
Piper, Linnæus.
Piptadenia, Bentham.
Piptanthus, D. Don.
Piptospatha, N. E. Brown.
Piqueria, Cavanilles.
Piscidia, Linnæus.
Pisonia, Linnæus.
Pissodes, Germar.
Pistacia, Linnæus.
Pistia, Linnæus.
Pisum, Linnæus.
Pitcairnia, L'Héritier.
Pithecoctenium, Martius.
Pithecolobium, Martius.
Pittosporum, Banks.
Placea, Miers.
Plagianthus, Forster.
Plagiolirion, Baker.
Planera, Gmelin.
Plantago, Linnæus.
Plasmodiophora, Woronin.
Platanus, Linnæus.
Platycarpha, Lessing.
Platycarpum, Humboldt and Bonpland.
Platycarya, Siebold and Zuccarini.
Platycerium, Desvaux.
Platyclinis, Bentham.
Platycodon, Alphonse de Candolle.
Platycrater, Siebold and Zuccarini.
Platylepis, A. Richard.
Platylobium, Smith.
Platylophus, Don.
Platypetalum, Brown.
Platystemon, Bentham.
Platystigma, Bentham.
Platytheca, Steetz.
Platyzoma, Brown.
Plectocomia, Martius and Blume.
Plectranthus, L'Héritier.
Plectritis, De Candolle.
Plectronia, Linnæus.
Pleea, Michaux.
Pleospora, Rabenhorst.
Pleroma, Don.
Pleurogyne, Eschscholtz.
Pleuropetalum, J. D. Hooker.
Pleurospermum, Hoffmann.
Pleurothallis, R. Brown.
Plocama, Aiton.
Plocoglottis, Blume.
Pluchea, Cassini.
Plumbago, Linnæus.
Plumeria, Linnæus.
Plusia, Freitschke.
Plutella, Schranck.
Poa, Linnæus.
Podalyria, La Marck.
Podanthes, Haworth.
Podanthus, Lagasca.
Podocarpus, L'Héritier.
Podolasia, N. E. Brown.
Podolepis, Labillardière.
Podophyllum, Linnæus.
Podopterus, Humboldt and Bonpland.
Podostigma, Elliott.
Podotheca, Cassini.
Pogogyne, Bentham.
Pogonia, Jussieu.
Pogonopus, Klotzsch.
Pogostemon, Desfontaines.
Poinciana, Linnæus.
Poiretia, Ventenat.
Poitæa, Ventenat.
Poivrea, Commerson.
Polanisia, Rafinesque.
Polemonium, Linnæus.
Polianthes, Linnæus.
Polyalthia, Blume.
Polycalymma, F. Mueller.
Polycarpæa, La Marck.
Polycycnis, Reichenbach, jun.
Polygala, Linnæus.
Polygonatum, Adanson.
Polygonum, Linnæus.
Polymnia, Linnæus.
Polypodium, Linnæus.
Polyporus, Michaux.
Polystachya, Hooker.
Polyxena, Kunth.
Pomaderris, Labillardière.
Pomaria, Cavanilles.
Pomax, Solander.
Ponera, Lindley.
Pongamia, Ventenat.
Pontederia, Linnæus.
Ponthieva, R. Brown.
Populus, Linnæus.
Porana, Burmann.
Poranthera, Rudge.
Porlieria, Ruiz and Pavon.
Portea, C. Koch.
Portlandia, P. Browne.
Portulaca, Linnæus.
Portulacaria, Jacquin.
Posoqueria, Aublet.
Potamogeton, Linnæus.
Potentilla, Linnæus.
Poterium, Linnæus.
Pothos, Linnæus.
Pourouma, Aublet.
Prasophyllum, R. Brown.
Pratia, Gaudichaud.
Premna, Linnæus.
Prenanthes, Linnæus.
Prepusa, Martius.
Prescottia, Lindley.
Preslia, Opitz.
Prestoea, J. D. Hooker.
Prestonia, R. Brown.
Priestleya, De Candolle.
Primula, Linnæus.
Prionium, E. Meyer.
Prismatocarpus, L'Héritier.
Pritchardia, Seemann and H. Wendland.
Priva, Adanson.
Prockia, Linnæus.
Proclesia, Klotzsch.
Pronaya, Hügel.
Proserpinaca, Linnæus.
Prosopis, Linnæus.
Prostanthera, Labillardière.
Protea, Linnæus.
Proustia, Lagasca.
Prunella, Linnæus.
Prunus, Linnæus.
Psamma, Palisot de Beauvois.
Psammisia, Klotzsch.
Pseudodracontium, N. E. Brown.
Pseudolarix, Gordon.
Pseudopanax, C. Koch.
Pseudotsuga, Carrière.
Psidium, Linnæus.
Psilotum, Swartz.
Psoralea, Linnæus.
Psychotria, Linnæus.
Psylla, Geoffroy.
Ptelea, Linnæus.
Ptelidium, Thouars.
Pteris, Linnæus.
Pterocarpus, Linnæus.
Pterocarya, Kunth.
Pterodiscus, Hooker.
Pterolobium, R. Brown.
Pteroneurum, De Candolle.
Pterospermum, Schreber.
Pterostylis, R. Brown.
Pterygodium, Swartz.
Ptilomeris, Nuttall.
Ptychosperma, Labillardière.
Puccinia, Persoon.
Pueraria, De Candolle.
Pulmonaria, Linnæus.
Pultenæa, Smith.
Punica, Linnæus.
Pupalia, Jussieu.
Purshia, De Candolle.
Puschkinia, Adams.
Putoria, Persoon.
Putterlickia, Endlicher.
Puya, Molina.
Pycnostachys, Hooker.
Pyralis, Linnæus.
Pyrethrum, Gærtner.
Pyrola, Linnæus.
Pyrularia, Michaux.
Pyrus, Linnæus.
Pythium, Nees.
Pyxidanthera, Michaux.

Qualea, Aublet.
Quaqua, N. E. Brown.
Quassia, Linnæus.
Quekettia, Lindley.
Quercus, Linnæus.
Quesnelia, Gaudichaud.
Quillaja, Molina.
Quisqualis, Linnæus.
Quivisia, Commerson.

Rafnia, Thunberg.
Raillardia, Gaudichaud.
Ramondia, L. C. Richard.
Ramularia, Unger.
Randia, Linnæus.
Ranunculus, Linnæus.
Raphanus, Linnæus.
Raphia, Palisot de Beauvois.
Raphistemma, Wallich.
Raspalia, Brongniart.
Ratonia, De Candolle.
Rauwolfia, Linnæus.
Ravenala, Adanson.
Ravenea, Bouché.

Genera and their Authors—*continued.*

Ravenia, Vellozo.
Reaumuria, Linnæus.
Reevesia, Lindley.
Regelia, Schauer.
Rehmannia, Liboschitz.
Reineckea, Kunth.
Reinwardtia, Dumortier.
Relhania, L'Héritier.
Remusatia, Schott.
Renanthera, Loureiro.
Renealmia, Linnæus, jun.
Reseda, Linnæus.
Restio, Linnæus.
Restrepia, Humboldt, Bonpland, and Kunth.
Retanilla, Brongniart.
Retinia, Guénée.
Retiniphyllum, Humboldt and Bonpland.
Retzia, Thunberg.
Rhagodia, R. Brown.
Rhamnus, Linnæus.
Rhaphidophora, Schott.
Rhaphiolepis, Lindley.
Rhaphithamnus, Miers.
Rhapidophyllum, H. Wendland and Drude.
Rhapis, Linnæus, jun.
Rhaponticum, La Marck.
Rheedia, Linnæus.
Rheum, Linnæus.
Rhexia, Linnæus.
Rhinacanthus, Nees.
Rhinanthus, Linnæus.
Rhipogonum, Forster.
Rhipsalis, Gærtner.
Rhizophora, Linnæus.
Rhodamnia, Jack.
Rhodites, Hartig.
Rhodochiton, Zuccarini.
Rhododendron, Linnæus.
Rhodoleia, Hooker.
Rhodomyrtus, De Candolle.
Rhodora, Linnæus.
Rhodospatha, Pœppig and Endlicher.
Rhodostachys, Philippi.
Rhodothamnus, Reichenbach.
Rhodotypos, Siebold and Zuccarini.
Rhoeo, Hance.
Rhopalostylis, H. Wendland and Drude.
Rhus, Linnæus.
Rhynchanthera, De Candolle.
Rhynchitis, Herbst.
Rhynchoglossum, Blume.
Rhynchosia, Loureiro.
Rhynchostylis, Blume.
Rhynchotechum, Blume.
Rhytidophyllum, Martius.
Rhytisma, Fries.
Ribes, Linnæus.
Richardia, Kunth.
Richardsonia, Kunth.
Richea, R. Brown.
Ricinus, Linnæus.
Ricotia, Linnæus.
Rigidella, Lindley.
Riocreuxia, Decaisne.
Ritchiea, Brown.
Rivea, Choisy.
Rivina, Linnæus.
Robinia, Linnæus.
Rochea, De Candolle.
Rodgersia, Asa Gray.
Rodriguezia, Ruiz and Pavon.
Roella, Linnæus.
Rœmeria, De Candolle.
Roezlia, Regel.
Rohdea, Roth.
Rolandra, Rottboell.
Romanzoffia, Chamisso.
Romneya, Harvey.
Romulea, Maratti.
Rondeletia, Linnæus.
Ronnbergia, Morren.
Rosa, Linnæus.
Roscheria, H. Wendland.
Roscoea, Smith.
Rosmarinus, Linnæus.
Rottboellia, Linnæus, jun.
Roupala, Aublet.
Roupellia, Wallich.
Rourea, Aublet.
Royena, Linnæus.
Roylea, Wallich.
Rubia, Linnæus.
Rubus, Linnæus.
Rudbeckia, Linnæus.
Rudgea, Salisbury.
Rudolphia, Willdenow.
Ruellia, Linnæus.
Ruizia, Cavanilles.
Rulingia, R. Brown.
Rumex, Linnæus.
Ruppia, Linnæus.
Ruscus, Linnæus.
Russelia, Jacquin.
Ruta, Linnæus.
Ruyschia, Jacquin.
Ryania, Vahl.
Ryssopterys, Blume.

Sabal, Adanson.
Sabbatia, Adanson.
Sabicea, Aublet.
Sabinea, De Candolle.
Saccharum, Linnæus.
Saccolabium, Blume.
Sadleria, Kaulfuss.
Sageretia, Brongniart.
Sagina, Linnæus.
Sagittaria, Linnæus.
Sagræa, De Candolle.
Salacia, Linnæus.
Salicornia, Linnæus.
Salix, Linnæus.
Salmea, De Candolle.
Salpichroa, Miers.
Salpiglossis, Ruiz and Pavon.
Salsola, Linnæus.
Salvadora, Linnæus.
Salvia, Linnæus.
Salvinia, Michaux.
Sambucus, Linnæus.
Samolus, Linnæus.
Samyda, Linnæus.
Sanchezia, Ruiz and Pavon.
Sandersonia, Hooker.
Sandoricum, Cavanilles.
Sanguinaria, Linnæus.
Sanseveria, Thunberg.
Santalum, Linnæus.
Santolina, Linnæus.
Sanvitalia, La Marck.
Saperda, Fabricius.
Sapindus, Linnæus.
Sapium, P. Browne.
Saponaria, Linnæus.
Sapota, Gærtner.
Saraca, Linnæus.
Saracha, Ruiz and Pavon.
Sarcanthus, Lindley.
Sarcocapnos, De Candolle.
Sarcocaulon, De Candolle.
Sarcocephalus, Afzelius.
Sarcochilus, R. Brown.
Sarcococca, Lindley.
Sarcocolla, Kunth.
Sarcolobus, R. Brown.
Sarcostemma, R. Brown.
Sarmienta, Ruiz and Pavon.
Sarracenia, Linnæus.
Sassafras, Nees.
Satureia, Linnæus.
Satyrium, Swartz.
Saundersia, Reichenbach, jun.
Sauraja, Willdenow.
Sauromatum, Schott.
Sauropus, Blume.
Saururus, Linnæus.
Saussurea, De Candolle.
Sauvagesia, Linnæus.
Saxegothea, Lindley.
Saxifraga, Linnæus.
Saxofridericia, Robert Schomburgk.
Scabiosa, Linnæus.
Scævola, Linnæus.
Scaphyglottis, Pœppig and Endlicher.
Scelochilus, Klotzsch.
Schæfferia, Jacquin.
Schaueria, Nees.
Scheelea, Karsten.
Schelhammera, R. Brown.
Scheuchzeria, Linnæus.
Schima, Reinwardt.
Schinus, Linnæus.
Schismatoglottis, Zollikofer and Morren.
Schismus, Palisot de Beauvois.
Schizæa, Smith.
Schizandra, Michaux.
Schizanthus, Ruiz and Pavon.
Schizobasis, Baker.
Schizodium, Lindley.
Schizolobium, Vogel.
Schizomeria, Don.
Schizopetalon, Sims.
Schizophragma, Siebold and Zuccarini.
Schizostylis, Backhouse and Harvey.
Schkuhria, Roth.
Schlimmia, Planchon.
Schlumbergeria, Morren.
Schmidelia, Linnæus.
Schœnia, Steetz.
Schœnorchis, Blume.
Schœnus, Linnæus.
Schœpfia, Schreber.
Schomburgkia, Lindley.
Schotia, Jacquin.
Schouwia, De Candolle.
Schradera, Vahl.
Schranckia, Willdenow

Genera and their Authors—*continued.*

Schwannia, Endlicher.
Schweiggeria, Sprengel.
Schwenkia, Linnæus.
Sciadophyllum, P. Browne.
Sciadopitys, Siebold and Zuccarini.
Scilla, Linnæus.
Scindapsus, Schott.
Scirpus, Linnæus.
Scleranthus, Linnæus.
Scleria, Bergius.
Sclerothamnus, R. Brown.
Scolopendrium, Smith.
Scolymus, Linnæus.
Scoparia, Linnæus.
Scopolia, Jacquin.
Scorpiurus, Linnæus.
Scorzonera, Linnæus.
Scottea, R. Brown.
Scrophularia, Linnæus.
Scutellaria, Linnæus.
Scuticaria, Lindley.
Sebæa, R. Brown.
Secale, Linnæus.
Secamone, R. Brown.
Sechium, P. Browne.
Securidaca, Linnæus.
Securigera, De Candolle.
Securinega, Jussieu.
Sedum, Linnæus.
Seemannia, Regel.
Selaginella, Sprengel.
Selago, Linnæus.
Selenia, Nuttall.
Selenipedium, Reichenbach, jun.
Selinum, Linnæus.
Semecarpus, Linnæus, jun.
Semeiandra, Hooker and Arnott.
Semele, Kunth.
Sempervivum, Linnæus.
Senecio, Linnæus.
Sequoia, Endlicher.
Seraphyta, Fischer and Meyer.
Serapias, Linnæus.
Serenoa, J. D. Hooker.
Sericocarpus, Nees.
Seringia, J. Gay.
Serissa, Commerson.
Serjania, Plumier.
Serpicula, Linnæus.
Serratula, Linnæus.
Serruria, Salisbury.
Sertifera, Lindley.
Sesamum, Linnæus.
Sesbania, Persoon.
Seseli, Linnæus.
Sesia, Fabricius.
Sesleria, Scopoli.
Sesuvium, Linnæus.
Setaria, Palisot de Beauvois.
Severinia, Tenore.
Sewerzowia, Regel and Schmalhausen.
Seymeria, Pursh.
Shepherdia, Nuttall.
Sibthorpia, Linnæus.
Sicyos, Linnæus.
Sida, Linnæus.
Sidalcea, Asa Gray.
Sideritis, Linnæus.
Sideroxylon, Linnæus.
Siebera, Reichenbach.
Siegesbeckia, Linnæus.
Sigmatostalyx, Reichenbach, jun.
Silaus, Besser.
Silene, Linnæus.
Silpha, Linnæus.
Silphium, Linnæus.
Silybum, Gærtner.
Simaba, Aublet.
Simarouba, Aublet.
Simethis, Kunth.
Simmondsia, Nuttall.
Sinapis, Linnæus.
Sinningia, Nees.
Siphocampylos, Pohl.
Siphonophora, Koch.
Sirex, Linnæus.
Sisymbrium, Linnæus.
Sisyrinchium, Linnæus.
Sitona, Germar.
Sium, Linnæus.
Skimmia, Thunberg.
Sloanea, Linnæus.
Smeathmannia, Solander.
Smilacina, Desfontaines.
Smilax, Linnæus.
Smithia, Aiton.
Smyrnium, Linnæus.
Sobralia, Ruiz and Pavon.
Socratea, Karsten.
Solandra, Swartz.
Solanum, Linnæus.
Solaria, Philippi.
Soldanella, Linnæus.
Solenanthus, Ledebour.
Solenidium, Lindley.
Solenomelus, Miers.
Solenophora, Bentham.
Solidago, Linnæus.
Sollya, Lindley.
Sonchus, Linnæus.
Sonerila, Roxburgh.
Sonneratia, Linnæus, jun.
Sophora, Linnæus.
Sophronitis, Lindley.
Sopubia, Hamilton.
Sorghum, Persoon.
Sorindeia, Thouars.
Sorocephalus, R. Brown.
Sowerbæa, Smith.
Sparaxis, Ker.
Sparganium, Linnæus.
Sparmannia, Linnæus, jun.
Spartina, Schreber.
Spartium, Linnæus.
Spartothamnus, Allan Cunningham.
Spatalla, Salisbury.
Spathantheum, Schott.
Spathegaster, Hartig.
Spathelia, Linnæus.
Spathicarpa, Hooker.
Spathiphyllum, Schott.
Spathodea, Palisot de Beauvois.
Spathoglottis, Blume.
Specularia, Heister.
Speirantha, Baker.
Spermacoce, Linnæus.
Sphacele, Bentham.
Sphæralcea, St. Hilaire.
Sphærolobium, Smith.
Sphærophysa, De Candolle.
Sphæropteris, Wallich.
Sphagnum, Dillenius.
Sphenandra, Bentham.
Sphenodesma, Jack.
Spigelia, Linnæus.
Spilanthes, Linnæus.
Spilosoma, Stephens.
Spinacia, Linnæus.
Spiræa, Linnæus.
Spiranthera, St. Hilaire.
Spiranthes, L. C. Richard.
Spironema, Lindley.
Spondias, Linnæus.
Sporobolus, R. Brown.
Spraguea, Torrey.
Sprekelia, Heister.
Sprengelia, Smith.
Spyridium, Fenzl.
Staavia, Thunberg.
Stachys, Linnæus.
Stachytarpheta, Vahl.
Stachyurus, Siebold and Zuccarini.
Stackhousia, Smith.
Stæhelina, Linnæus.
Stangeria, T. Moore.
Stanhopea, Frost.
Stanleya, Nuttall.
Stapelia, Linnæus.
Staphylea, Linnæus.
Statice, Linnæus.
Stauntonia, De Candolle.
Stauranthera, Bentham.
Stauropsis, Reichenbach, jun.
Staurostigma, Scheidweiler.
Stelis, Swartz.
Stellaria, Linnæus.
Stellera, Linnæus.
Stemodia, Linnæus.
Stemona, Loureiro.
Stenanthera, R. Brown.
Stenanthium, Asa Gray.
Stenia, Lindley.
Stenocarpus, R. Brown.
Stenochilus, R. Brown.
Stenocoryne, Lindley.
Stenoglossum, Humboldt, Bonpland, and Kunth.
Stenoglottis, Lindley.
Stenomesson, Herbert.
Stenoptera, Presl.
Stenospermation, Schott.
Stenostomum, Gærtner.
Stenotaphrum, Trinius.
Stephanandra, Siebold and Zuccarini.
Stephania, Loureiro.
Stephanocoma, Lessing.
Stephanomeria, Nuttall.
Stephanotis, Thouars.
Sterculia, Linnæus.
Stereosandra, Blume.
Sterigma, De Candolle.
Steriphoma, Sprengel.
Sternbergia, Waldstein and Kitaibel.
Steudnera, C. Koch.
Stevensonia, Duncan.
Stevia, Cavanilles.
Stifftia, Mikan.
Stigmaphyllon, A. Jussieu.
Stillingia, Linnæus.
Stipa, Linnæus.
Stokesia, L'Héritier.
Stranvæsia, Lindley.
Stratiotes, Linnæus.

Genera and their Authors—*continued.*

Stravadium, Miquel.
Streblorhiza, Endlicher.
Streblus, Loureiro.
Strelitzia, Aiton.
Streptanthera, Sweet.
Streptanthus, Nuttall.
Streptocarpus, Lindley.
Streptopus, Michaux.
Streptosolen, Miers.
Strobilanthes, Blume.
Strobilorachis, Link, Klotzsch, and Otto.
Stromanthe, Sonder.
Strophanthus, De Candolle.
Stropholirion, Torrey.
Strumaria, Jacquin.
Struthiola, Linnæus.
Strychnos, Linnæus.
Stuartia, Linnæus.
Stylidium, Swartz.
Stylophorum, Nuttall.
Stylosanthes, Swartz.
Stypandra, R. Brown.
Styphelia, Smith.
Styrax, Linnæus.
Suæda, Forskahl.
Subularia, Linnæus.
Succovia, Medikus.
Sunipia, Lindley.
Sutherlandia, R. Brown.
Sutrina, Lindley.
Suttonia, Achille Richard.
Swainsona, Salisbury.
Swartzia, Schreber.
Swertia, Linnæus.
Swietenia, Linnæus.
Syagrus, Martius.
Sycomorus, Gasparrini.
Symphoricarpus, Jussieu.
Symphyandra, Alphonse de Candolle.
Symphyostemon, Miers.
Symphytum, Linnæus.
Sympieza, Lichtenstein.
Symplocarpus, Salisbury.
Symplocos, Linnæus.
Synadenium, Boissier.
Synandra, Nuttall.
Synechanthus, H. Wendland.
Syngonium, Schott.
Synnotia, Sweet.
Syringa, Linnæus.
Syringodea, J. D. Hooker.
Syrphus, Stephens.
Szowitzia, Fischer and Meyer.

Tabebuia, Gomez.
Tabernæmontana, Linnæus.
Tacca, Forster.
Taccarum, Brongniart.
Tachiadenus, Grisebach.
Tachigalia, Aublet.
Tacsonia, Jussieu.
Tæniophyllum, Blume.
Tænitis, Swartz.
Tagetes, Linnæus.
Tainia, Blume.
Talauma, Jussieu.
Taligalea, Aublet.
Talinum, Adanson.
Talisia, Aublet.
Tamarindus, Linnæus.
Tamarix, Linnæus.
Tamonea, Aublet.
Tamus, Linnæus.
Tanacetum, Linnæus.
Tanghinia, Thouars.
Taraxacum, Haller.
Tarchonanthus, Linnæus.
Tauscheria, Fischer.
Taverniera, De Candolle.
Taxodium, L. C. Richard.
Taxus, Linnæus.
Tecoma, Jussieu.
Tecophilæa, Bertero.
Tectona, Linnæus, jun.
Teedia, Rudolphi.
Teesdalia, Brown.
Telephium, Linnæus.
Telfairia, Hooker.
Telipogon, Humboldt, Bonpland, and Kunth.
Tellima, Brown.
Telopea, R. Brown.
Templetonia, R. Brown.
Tenaris, Ernst Meyer.
Tephrosia, Persoon.
Teramnus, Swartz.
Terminalia, Linnæus.
Ternstrœmia, Linnæus, jun.
Tessaria, Ruiz and Pavon.
Testacella, Cuvier.
Testudinaria, Salisbury.
Tetracera, Linnæus.
Tetradium, Loureiro.
Tetragonia, Linnæus.
Tetragonotheca, Linnæus.
Tetramicra, Lindley.
Tetranema, Bentham.
Tetranthus, Swartz.
Tetranychus, Dufour.
Tetrapogon, Desfontaines.
Tetrapterys, Cavanilles.
Tetratheca, Smith.
Tetrazygia, L. C. Richard.
Teucrium, Linnæus.
Teysmannia, Reichenbach, jun.
Thalia, Linnæus.
Thalictrum, Linnæus.
Thamnea, Solander.
Thamnochortus, Bergius.
Thapsia, Linnæus.
Thecostele, Reichenbach, jun.
Thelebolus, Tode.
Thelephora, Ehrhardt.
Thelesperma, Lessing.
Thelygonum, Linnæus.
Thelymitra, Forster.
Themistoclesia, Klotzsch.
Thenardia, Humboldt, Bonpland, and Kunth.
Theobroma, Linnæus.
Theophrasta, Jussieu.
Thera, Stephens.
Thermopsis, R. Brown.
Theropogon, Maximowicz.
Thesium, Linnæus.
Thespesia, Correa da Serra.
Thevetia, Linnæus.
Thibaudia, Pavon.
Thladiantha, Bunge.
Thlaspi, Linnæus.
Thomasia, J. Gay.
Thomsonia, Wallich.
Thouinia, Poiteau.
Thrinax, Linnæus, jun.
Thrips, Linnæus.
Thryallis, Martius.
Thryptomene, Endlicher.
Thunbergia, Linnæus, jun.
Thuya, Linnæus.
Thuyopsis, Siebold and Zuccarini.
Thymbra, Linnæus.
Thymelæa, Endlicher.
Thymus, Linnæus.
Thyrsacanthus, Nees.
Thyrsopteris, Kunze.
Thysanotus, R. Brown.
Tiarella, Linnæus.
Ticorea, Aublet.
Tigridia, Ker.
Tilia, Linnæus.
Tiliacora, Colebrooke.
Tillæa, Linnæus.
Tillandsia, Linnæus.
Tilletia, Tulasne.
Tinantia, Scheidweiler.
Tinnea, Kotsch.
Tipularia, Nuttall.
Tithonia, Desfontaines.
Tococa, Aublet.
Tocoyena, Aublet.
Todaroa, Achille Richard.
Toddalia, Jussieu.
Todea, Willdenow.
Tofieldia, Hudson.
Tolmiea, Torrey and Gray.
Tolpis, Adanson.
Tordylium, Linnæus.
Torenia, Linnæus.
Torreya, Arnott.
Torrubia, Tulasne.
Tortrix, Linnæus.
Tournefortia, Linnæus.
Tourretia, Jussieu.
Tovomita, Aublet.
Toxicodendron, Thunberg.
Toxicophlæa, Harvey.
Trachea, Guénée.
Trachelium, Linnæus.
Trachelospermum, Lemaire.
Trachycarpus, H. Wendland.
Trachymene, Rudge.
Trachystemon, Don.
Tradescantia, Linnæus.
Tragia, Linnæus.
Tragopogon, Linnæus.
Trametes, Fries.
Trapa, Linnæus.
Trautvetteria, Fischer and Meyer.
Treculia, Decaisne.
Tremandra, R. Brown.
Tremex, Jurine.
Trevesia, Visiani.
Trevoa, Miers.
Trewia, Linnæus.
Trianea, Karsten.
Trianthema, Linnæus.
Trias, Lindley.
Tribulus, Linnæus.
Trichantha, Hooker.
Trichilia, Linnæus.
Trichinium, R. Brown.
Trichocaulon, N. E. Brown.
Trichocentrum, Pœppig and Endlicher.

Genera and their Authors—*continued.*

Trichoceros, Humboldt, Bonpland, and Kunth.
Trichodesma, R. Brown.
Trichoglottis, Blume.
Trichomanes, Smith.
Trichopetalum, Lindley.
Trichopilia, Lindley.
Trichosacme, Zuccarini.
Trichosanthes, Linnæus.
Trichosma, Lindley.
Trichostema, Linnæus.
Tricoryne, R. Brown.
Tricuspidaria, Ruiz and Pavon.
Tricyrtis, Wallich.
Tridax, Linnæus.
Trientalis, Linnæus.
Trifolium, Linnæus.
Trifurcia, Herbert.
Triglochin, Linnæus.
Trigonella, Linnæus.
Trigonia, Aublet.
Trigonidium, Lindley.
Trilisa, Cassini.
Trillium, Linnæus.
Trimezia, Salisbury.
Trinia, Hoffmann.
Triodia, R. Brown.
Triolena, Naudin.
Triopterys, Linnæus.
Triosteum, Linnæus.
Triphasia, Loureiro.
Triphysaria, Fischer and Meyer.
Triplaris, Linnæus.
Tripsacum, Linnæus.
Tripterygium, J. D. Hooker.
Triptilion, Ruiz and Pavon.
Trisetum, Persoon.
Tristagma, Pœppig and Endlicher.
Tristania, R. Brown.
Triteleia, Lindley.
Trithrinax, Martius.
Triticum, Linnæus.
Tritonia, Ker.
Triumfetta, Linnæus.
Trixis, P. Browne.
Trizeuxis, Lindley.
Trochetia, De Candolle.
Trochiscanthes, Koch.
Trochocarpa, R. Brown.
Trollius, Linnæus.
Tropæolum, Linnæus.
Trophis, Linnæus.
Tropidia, Lindley.
Troximon, Nuttall.
Trymalium, Fenzl.
Tryphæna, Ochsenheimer.
Tsuga, Carrière.
Tulbaghia, Linnæus.
Tulipa, Linnæus.
Tunica, Scopoli.
Tupidanthus, J. D. Hooker and Thomson.
Tupistra, Ker.
Turnera, Linnæus.
Turpinia, Ventenat.
Turræa, Linnæus.
Tussacia, Reichenbach.
Tussilago, Linnæus.
Tychius, Germar.
Tydæa, Decaisne.
Tylophora, R. Brown.
Typha, Linnæus.
Typhonium, Schott.
Tytonia, G. Don.

Ulex, Linnæus.
Ullucus, Lozano.
Ulmus, Linnæus.
Umbellularia, Nees.
Uncaria, Schreber.
Uncifera, Lindley.
Ungnadia, Endlicher.
Uniola, Linnæus.
Unona, Linnæus, jun.
Uraria, Desvaux.
Urceolina, Reichenbach.
Urechites, Mueller.
Urena, Linnæus.
Urginea, Steinheil.
Urocystis, Rabenhorst.
Uroskinnera, Lindley.
Urospatha, Schott.
Urospermum, Scopoli.
Ursinia, Gærtner.
Urtica, Linnæus.
Urvillea, Humboldt, Bonpland, and Kunth.
Ustilago, Persoon.
Utricularia, Linnæus.
Uvaria, Linnæus.
Uvularia, Linnæus.

Vaccinium, Linnæus.
Vaillantia, De Candolle.
Valdivia, Remy.
Valeriana, Linnæus.
Valerianella, Mœnch.
Vallaris, Burmann.
Vallesia, Ruiz and Pavon.
Vallisneria, Linnæus.
Vallota, Herbert.
Vanda, R. Brown.
Vandellia, Linnæus.
Vanessa, Ochsenheimer.
Vangueria, Jussieu.
Vanilla, Swartz.
Veitchia, H. Wendland.
Velezia, Linnæus.
Vella, Linnæus.
Velleia, Smith.
Vellozia, Vandelli.
Veltheimia, Gleditsch.
Venidium, Lessing.
Ventilago, Gærtner.
Veratrum, Linnæus.
Verbascum, Linnæus.
Verbena, Linnæus.
Verbesina, Linnæus.
Vernonia, Schreber.
Veronica, Linnæus.
Verschaffeltia, Wendland.
Verticordia, De Candolle.
Vesicaria, La Marck.
Veslingia, Visiani.
Vespuccia, Parlatore.
Vestia, Willdenow.
Viborgia, Thunberg.
Viburnum, Linnæus.
Vicia, Linnæus.
Victoria, Lindley.
Vigna, Savi.
Viguiera, Humboldt, Bonpland, and Kunth.
Villanova, Lagasca.
Villaresia, Ruiz and Pavon.
Villarsia, Ventenat.
Vilmorinia, De Candolle.
Viminaria, Smith.
Vinca, Linnæus.
Vincetoxicum, Mœnch.
Viola, Linnæus.
Virgilia, La Marck.
Viscum, Linnæus.
Vismia, Vellozo.
Visnea, Linnæus, jun.
Vitex, Linnæus.
Vitis, Linnæus.
Vittaria, Smith.
Viviania, Cavanilles.
Voandzeia, Thouars.
Vochysia, Jussieu.
Vouapa, Aublet.
Voyria, Aublet.

Wachendorfia, Linnæus.
Wahlenbergia, Schrader.
Wailesia, Lindley.
Waitzia, Wendland.
Waldsteinia, Willdenow.
Wallichia, Roxburgh.
Walsura, Roxburgh.
Waltheria, Linnæus.
Warrea, Lindley.
Washingtonia, H. Wendland.
Watsonia, Miller.
Webera, Schreber.
Wedelia, Jacquin.
Weinmannia, Linnæus.
Welfia, H. Wendland.
Welwitschia, J. D. Hooker.
Wendlandia, Bartling.
Werneria, Humboldt, Bonpland, and Kunth.
Westringia, Smith.
Whiteheadia, Harvey.
Whitfieldia, Hooker.
Widdringtonia, Endlicher.
Wigandia, Humboldt, Bonpland, and Kunth.
Willdenowia, Thunberg.
Willemetia, Brongniart.
Willughbeia, Roxburgh.
Wistaria, Nuttall.
Witheringia, L'Héritier.
Witsenia, Thunberg.
Woodfordia, Salisbury.
Woodsia, Brown.
Woodwardia, Smith.
Wormia, Rottboell.
Wrightia, R. Brown.
Wulfenia, Jacquin.
Wulffia, Necker.
Wullschlægelia, Reichenbach, jun.
Wurmbea, Thunberg.
Wyethia, Nuttall.

Xanthisma, De Candolle.
Xanthium, Linnæus.
Xanthocephalum, Willdenow.
Xanthoceras, Bunge.
Xanthochymus, Roxburgh.
Xanthoriza, Marshall.
Xanthorrhœa, Smith.

Genera and their Authors—*continued.*

Xanthosia, Rudge.
Xanthosoma, Schott.
Xeranthemum, Linnæus.
Xeronema, Brongniart.
Xerophyllum, Michaux.
Xerotes, R. Brown.
Ximenia, Linnæus.
Xiphidium, Aublet.
Xylobium, Lindley.
Xylomelum, Smith.
Xylopia, Linnæus.
Xyris, Linnæus.
Xysmalobium, R. Brown.

Yponomeuta, Latreille.
Yucca, Linnæus.

Zacintha, Gærtner.
Zalacca, Reinwardt.
Zaluzania, Persoon.
Zaluzianskia, J. W. Schmidt.
Zamia, Linnæus.
Zamioculcas, Schott.
Zannichellia, Linnæus.
Zanthoxylum, Linnæus.
Zauschneria, Presl.
Zea, Linnæus.
Zebrina, Schnitzlein.
Zehneria, Endlicher.
Zenobia, Don.
Zephyranthes, Herbert.
Zeuxina, Lindley.
Zeuzera, Latrielle.
Zexmenia, Llave and Lexarza.

Zieria, Smith.
Zilla, Forskahl.
Zingiber, Adanson.
Zinnia, Linnæus.
Zizania, Linnæus.
Ziziphora, Linnæus.
Zizyphus, Jussieu.
Zomicarpa, Schott.
Zomicarpella, N. E. Brown.
Zornia, Gmelin.
Zostera, Linnæus.
Zosterostylis, Blume.
Zygadenus, Michaux.
Zygopetalum, Hooker.
Zygophyllum, Linnæus.
Zygostates, Lindley.

PRONOUNCING DICTIONARY

OF THE

ORDINAL, GENERIC, AND SPECIFIC NAMES GIVEN IN THIS WORK.

By the Rev. PERCY W. MYLES, B.A., F.L.S.,

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THE pronunciation of the scientific names of plants is, at present, in the same chaotic state in which their synonymy was until many specialists (such as Messrs. B. Daydon Jackson, J. Britten, and others) undertook to reduce it to some kind of order. Synonymy has been brought under settled rules; but pronunciation is still quite anarchic; "every man does that which is right in his own eyes." Take, for example, the two common garden genera, *Gladiolus* and *Clematis;* the name of each is pronounced in three quite different ways: in neither case is there any doubt whatever about the true pronunciation, and yet those who adopt it are in a very small minority indeed. The way in which many gardeners make havoc of the names of plants has been a frequent subject of satire with philologists and other writers: Dr. Peile, the new Master of Christ's College, Cambridge, gives some amusing instances of this in his works on Philology. But the gardeners have not been altogether to blame in this matter; they have had no accessible authority to consult, and accordingly have been free to exercise their own individual ingenuity (or eccentricity) in each case.

In the Pronouncing Dictionary now offered to the public an attempt has been made to supply some such standard of reference as is urgently needed. As it is the first "essay" in the English language (and, as far as we know, in any language) to fully examine the whole question on first principles, and afford information on all points

Pronouncing Dictionary—*continued.*

connected with pronunciation, it does not pretend to be more than an *attempt*. Kindly criticisms and corrections are earnestly invited for the purpose of attaining to a more accurate standard of pronunciation in future editions of the "Dictionary of Gardening." At any rate, an honest endeavour has now been made to obtain, from first sources, authoritative decisions on the subject.

For Accentuation and Quantity the works of Theophrastus, Dioscorides, and Pliny, have been re-read, so as to ascertain how far the present pronunciation has been distorted and vulgarised from the original names so often first given by these authors. In the special pronunciation of Latin attention has been paid to all the latest English authorities, such as the Syllabus issued by Messrs. Palmer and Munro in 1872, and, since that date, the works of Mr. A. J. Ellis (the greatest English authority on phonetics), of Dr. Kennedy, and of Mr. Roby, and the "Summary of Latin Pronunciation in the Augustan Period" lately issued by the Cambridge Philological Society. Of course, all the minute details given by these authorities have not been entered into or reproduced, nor have their points of variance been discussed; but an attempt has been made to draw from the consensus of leading scholars a broad general outline of the best information at present attainable on the *vexata quæstio* of Latin pronunciation.

In addition to the words of classical derivation which have been dealt with there are a number of names which are either derived from various other foreign tongues (*e.g.*, Arabic, Malay, the native languages of America, &c.), or are commemorative, *i.e.*, are derived from the names of eminent botanists, and others who have been intimately connected with botanical studies. To inquire afresh into the accurate pronunciation of all these names has not been found practicable for the present; and, accordingly, when it was impossible to obtain from printed authorities original information as to the foreign and commemorative names, those English botanists who have most fully entered into the subject have been carefully consulted. Among such botanists may be specially mentioned Withering in his "Systematic Arrangement," and Lindley in Loudon's "Encyclopædia of Plants" and in Paxton's "Botanical Dictionary." In recent times, Mr. Randal H. Alcock in his "Botanical Names," Sir J. D. Hooker in the "Student's Flora," Mr. W. B. Hemsley in his "Handbook of Trees, Shrubs, and Herbaceous Plants," and Mr. N. E. Brown in the Index to "English Botany," have bestowed considerable attention on the subject; though they have not had occasion to advance far into this wide field. In this Pronouncing Dictionary names derived from extra-classical languages, or, as they are sometimes called, aboriginal names, are printed altogether in italics; commemorative words and those of geographical origin have in

Pronouncing Dictionary—*continued.*

italics as much of the name from which they are derived as is reproduced in them—*e.g.*, Abuta (the name given by the natives in Guiana) appears *Ab-u′-ta;* Abatia (commemorative of Peter Abat) is printed *Ab-a′-tĭ*-a; antwerpensis (from Antwerp) *ant-werp*-en′-sis. Geographical and commemorative names, however, which were used in classical Latin, remain in the common type, *e.g.*, Ad-o′-nis, æth-ĭ-op′-ic-a.

All the words which are printed in ordinary type are presumed to be derived from Greek or Latin; and to enable the tyro to pronounce them with comparative accuracy the following special rules are given with regard to the three most important points.

I. *Accentuation (Stress of Voice).*—The sign ′ marks the syllable on which the accent or stress of voice falls. It has nothing to do with the quantity of the syllable, which may be either long or short: *e.g.*, am-ā′-ra, Al-ĭs′-ma. The secondary accent of polysyllables must be at least two syllables before the primary accent: *e.g.*, Ac′-ti-nol′-ep-is, Ac-ti′-noph-yl′-lum; but as the secondary accent is generally obvious and of comparatively little importance, it is only inserted in cases where doubt might arise.

II. *Quantity (Length or Shortness of Syllables).*—In this Dictionary, as a general rule, the quantity is shown by the manner in which the words are divided. When a vowel terminates any syllable, except the last, it is to be sounded long. When the syllable terminates with a consonant, the preceding vowel is to be considered short. This manner of dividing the words into syllables has been selected as the clearest way of showing the quantity of each vowel to ordinary readers; it is, of course, quite different from scientific syllabication, such as that of Mr. Ellis, which would be confusing to all except classical scholars: but as it is our primary object to be intelligible, even to the unlearned, we have preferred an approximation to the truth which can be easily understood by everyone. The following words, which are printed at the foot of each page, will exemplify the mode of distinguishing the quantity which has been adopted.

SHORT, as in *ăp*-art	*slĕn*-der	*thĭn*	*rŏt*-ten	pow-er-*fŭl*
LONG, as in ps*ā*-lmist	v*ē*-ined	mach-*ī*-nist	v*ō*-ter	r*ū*-ler

Diphthongs are always long. At the end of a word, a is almost always short; e, generally long; i, almost always long. Exceptions to these rules are marked long (–) or short (⏑).

III. *Pronunciation of Particular Letters.*—Most of the scientific names of plants, and other terms used in Botany, are derived from the Greek and Latin languages, and even the words originally from the Greek have been generally Latinised, *i.e.*, made to conform to Latin rules. The manner in which Latin has been, until lately, pronounced in this country

Pronouncing Dictionary—*continued.*

is thoroughly inaccurate and unscientific, and so entirely insular that in speech it is often quite unintelligible to foreigners, even to those who are good Latin scholars. As one of the chief advantages of the uniform Latin nomenclature of plants is that thus a sort of universal or international language is created, it is evident how much has been lost by our prejudiced adherence to a provincial mode of pronunciation. The modern English system of pronouncing Latin, long familiar in Dublin usage as far as the vowels are concerned, sanctioned by the Professors of Latin at Oxford and Cambridge in 1872, and lately made obligatory for honours at Cambridge, will undoubtedly be universally adopted in the future. It represents the actual pronunciation of the words when Latin was a living language; and it conforms to Continental usage, so that by its use the scientific names of plants are easily understood in conversation by educated men of every nation. After much consideration, and consultation with several eminent botanists, it has been determined to follow this system in the present work. The difference between the method which is now happily becoming obsolete and the accurate method which is taking its place will be understood from the following examples, in which an attempt is made to represent Latin sounds by their nearest English equivalents:

OLD METHOD.

Vowels.

a, short, as in	făt.	a, long, as in	bāther.
e, „ „	slĕnder.	e, „ „	ēvil.
i, „ „	thĭn.	i, „ „	īce.
o, „ „	rŏtten.	o, „ „	vōter.
u, „ „	stŭbborn.	u, „ „	mūle.
y, „ „	cўnical.	y, „ „	cўpher.

Diphthongs.

æ, œ } as *ee* in *feed.*

ei as in the word *eye.*

au as *aw* in *bawl.*

Consonants.

c and g hard before a, as in *c*ats, *g*aping.
„ „ „ o „ cows, *g*oring.
„ „ „ u „ *c*ud, *g*ulping.
c and g soft before e „ *c*entral, *g*entleman.
„ „ „ i „ *c*ircular, *g*in.
„ „ „ y „ *c*ynical, *g*ymnast.

CORRECT METHOD.

Vowels.

a, short, as in	ăpart.	a, long, as in	psālmist.
e, „ „	slĕnder.	e, „ „	vēined.
i, „ „	thĭn.	i, „ „	machīnist.
o, „ „	rŏtten.	o, „ „	vōter.
u, „ „	powerfŭl.	u, „ „	rūler.

y is sounded nearly like i, but the exact sound cannot be represented in English.

Diphthongs.

æ, œ, ei } nearly as *ai* in *pain.*

au as *ou* in *house.*

Consonants.

g always hard, as in *g*ood.
c „ „ „ *c*uscular.
ch „ „ „ *Ch*ristian.

Pronouncing Dictionary—*continued.*

N.B.—When a specific name is in the form of an ordinary Latin adjective, only one termination has generally been given; *e.g.*, of those in *us, a, um,* the form ab-brev-ĭ-a′-tus is used only when the generic or substantive name is masculine; but every reader can see for himself that ab-brev-ĭ-a′-ta (the feminine) and ab-brev-ĭ-a′-tum (the neuter) are to be pronounced in similar fashion. The same rule has been adopted with those in *is, e,* as tris′-tis, tris′-tĕ; but adjectives in *er, ra, rum,* as nig′-er, nig′-ra, nig′-rum, and those in *er, ris, re,* as a′-cer, a′-cris, a′-crĕ, have been given in the different forms in which they occur.

At the end of the Pronouncing Dictionary the principal words whose correct pronunciation differs strikingly from that in ordinary use will be discussed.

Ab-a′-ma*
Ab-a′-tĭ-a
ab-brev-ĭ-a′-tus
ab-chas′-ic-us
Ab-el′-ĭ-a*
Ab-e′-na
Ab′-ĭ-ēs
Ab-ĭ-et-in′-ĕ-æ
Ab′-ĭ-et-is
Ab-o′-bra
Ab-ol′-bod-a
ab-or-ti′-vum
Ab-rax′-as
Ab-ro′-ma
Ab-ro′-nĭ-a
ab-rot′-an-if-ol′-ĭ-um*
ab-rot′-an-ŏ-i′-dēs*
Ab-rot′-an-um
ab-rup′-tum
A′-brus
ab-sciss′-us
Ab-sin′-thĭ-um
Ab-u′-ta
ab-u-til-ŏ-i′-dēs
Ab-u′-tĭl-on
ab-yss-in′-ic-us
Ac-a′-cĭ-a
Ac-æ′-na
Ac-al′-yph-a
Ac-anth-a′-cĕ-æ
ac-anth-if-ol′-ĭ-us
Ac-anth′-ĭ-um
ac-anth-oc′-om-a*
ac-anth-o′-dēs*
Ac-anth-ol-i′-mŏn*
Ac-anth-op′-an-ax
Ac-anth-oph-ipp′-ĭ-um
Ac-anth-oph-œ′-nix
Ac-anth-orh-i′-za*
Ac-anth-ost-ach′-ŷ-um*
Ac-anth′-us
Ac-ar′-id-a
ac-au′-lis
ac-ce′-dens
ac-eph′-al-a*
Ac′-er*
Ac-er-a′-cĕ-æ
Ac-er-anth′-us
Ac′-er-as
Ac-er-at′-ĭ-um
ac-erb′-a
ac-er-if-ol′-ĭ-um
Ac-er-in′-ĕ-æ
ac-er′-in-um
Ac-er-it′-ĭ-um
ac-er-ŏ-i′-dēs
ac-er-o′-sa
Ac-e′-ti
Ac-e-to′-sa
Ac-e-to-sel′-la
Ach-an′-ĭ-a
Ach-er-ont′-ĭ-a
Ach-ill-e′-a
ach-ill-e′-æ-fol′-ĭ-a
ach-ill-e′-ŏ-i′-dēs
Ach-i-me′-nēs
Ach-i′-ras
Ach′-ras
Ach-rŏ-anth′-ēs
Ach-yr-anth′-ēs
Ach-yr-on′-ĭ-a
Ach-yr-op-ap′-pus
ac-ic′-ol-um
ac-ic-ul-a′-ris
ac′-id-a
ac-id-is′-sim-a
ac-in-a′-cĕ-um
ac-in-a′-cif-ol′-ĭ-a
Ac-in-e′-ta
ac-in-op-et′-al-a
Ac′-in-os
Ac-in-o′-tus*
Ac-ĭ-o′-tis
Ac-iph-yl′-la*
A′-cis
Ac-is-an-the′-ra*
Ack-er-man′-ni
Ac-land′-ĭ-æ
Ac-mad-e′-nĭ-a
Ac-mel′-la
Ac-me′-na
Ac-o′-kan-the′-ra
ac-on-if-ol′-ĭ-a
Ac-on-ĭ-op′-ter-is*
ac-on-i-tif-ol′-ĭ-us
Ac-on-i′-tum
Ac-on′-tĭ-as
Ac′-or-us
Ac-rad-e′-nĭ-a
Ac-rid-oc-arp′-us
Ac-rĭ-op′-sis
a′-crĕ*
a′-cris
ac-roc′-lad-on*
Ac-roc-li′-nĭ-um*
Ac-roc-om′-ĭ-a
Ac-ron-ych′-ĭ-a
Ac-ron-yc′-ta
Ac-rop-e′-ra*
Ac-roph′-or-us*
Ac-roph-yl′-lum
Ac-rop′-ter-is
Ac-ros-anth′-ēs
Ac-ros-por′-ĭ-um
ac-ros′-tich-ŏ-i′-dēs
Ac-ros′-tich-us*
Ac-rot′-rich-e*
ac-rot′-rich-um
Ac-tæ′-a
Ac-ti-nel′-la
Ac-ti′-nĭ-a
Ac′-ti-nid′-ĭ-a
Ac-ti′-nĭ-op′-ter-is
Ac-ti′-noc-ar′-pus
Ac′-ti-nol′-ep-is*
Ac′-ti-nom′-er-is*
Ac-ti′-non-e′-ma*
Ac-ti′-noph-yl′-lum
Ac′-ti-nost′-ach-ys

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ŏp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary —*continued.*

Ac′-ti-nost′-rob-us
Ac-ti-no′-tus
ac-u-lĕ-a′-tus
ac-u-lĕ-ol-a′-tus
Ac-n′-lĕ-us
ac-u′-min-a′-ta
Ac-un′-na
ac-u′-ta
ac-u-tang′-ul-a
ac-u-tif′-id-a
ac-u′-tif-lo′-ra*
ac-u′-tif-ol′-ĭ-a
ac-u-til′-ob-a*
ac-u′-tip-et′-al-a
Ac-yn′-tha
A′-da
Ad-am′-i
Ad-am′-ĭ-a
Ad-am′-sĭ-a
Ad-an-so′-nĭ-a
Ad-el′-gēs
Ad-e′-lob-ot′-rys*
Ad-e-nand′-ra
Ad-e-nan-the′-ra
Ad-e-nan′-thos
Ad-e-ni-le′-ma
*Ad-en′-ĭ-um**
Ad-e-noc-al-ym′-na
Ad-e-noc-ar′-pus
Ad-e-noph′-or-a
Ad-e-nop-od′-ĭ-a*
Ad-e-nost′-om-a*
Ad-e-nos′-tyl-ēs
Ad-e-not-rich′-ĭ-a
Ad-es′-mĭ-a
Ad-hat′-od-a
ad-ĭ-ant-if-ol′-ĭ-a
ad-ĭ-ant-ŏ-ĭ′-dēs
Ad-i-ant-op′-sis
Ad-ĭ-ant′-um
Ad′-ik-e
Ad′-in-a
Ad-lu′-mĭ-a
ad-mi-ra′-bil-is
ad-nasc′-ens
ad-na′-tum
Ad-o′-nid-um
Ad-o′-nis
ad-press′-a
ad-scend′-ens
ad-spers′-us
ad-surg′-ens
ad-ul-ter-i′-nus
ad-umb-ra′-ta
ad-un′-ca
ad′-ven-a
Æch′-mĕ-a
Æc-id′-ĭ-um
Æg-ic′-er-as
Æg′-il-ōps
Æg-iph′-il-a*
Æg′-le
æg′-ra
æg-yp′-tĭ-ac-a
æg-yp′-tic-a
æm′-ul-um
æn′-ĕ-a
Æ-ol-anth′-us
Æ-o′-nĭ-um
æ-quin-ox-ĭ-a′-lis
æ-quip-et′-al-a
æ-quit-ril′-ob-a
A-er-anth′-us
A-er-i′-dēs
A-er-ob′-ĭ-on
ær-u-gin-o′-sum
Æs-chyn-anth′-us
Æs-chyn-om′-en-e
æs-cul-if-ol′-ĭ-a
Æs′-cul-us
æs-ti-va′-lis
æs-ti′-vus
æs′-tŭ-ans
Æth-ĭ-on-e′-ma
æth-ĭ-op′-ic-a
æth-u-sif-ol′-ĭ-a
æt-nen′-sis
af-fi′-nis
af-ric-a′-na
a′-frum
Af-zel′-ĭ-a
Af-zel′-ĭ-i
Ag-al′-myl-a
Ag-an-is′-ĭ-a
Ag-an-os′-ma
Ag-ap-anth′-us
Ag-ap-e′-tēs
Ag-ard′-hĭ-i
Ag-ar′-ic-us
Ag-ast′-ach-ys
Ag′-ath-a
Ag-ath-æ′-a
Ag′-ath-is
Ag′-ath-om′-er-is
Ag′-ath-oph-yl′-lum
Ag′-ath-os′-ma
Ag′-ath-o′-tēs
Ag′-ath-yr′-sus
Ag-a′-ti
Ag-a′-ve*
ag-a′-vŏ-i′-dēs
ag-e′-rat-ŏ-i′-dēs
Ag-e′-rat-um*
Ag-e′-rĭ-a
ag-greg-a′-tum
Ag-læ′-a
Ag-lai′-a
Ag-lă-om-orph′-a
Ag-lă-on-e′-ma
ag-ni′-num
Ag-no′-stus
Ag′-nus-cas′-tus
Ag-os′-er-is
Ag′-raph-is
ag-rest′-is
ag-rif-ol′-ĭ-a
Ag′-ril-us
Ag-rim-o′-nĭ-a
Ag-rĭ-o′-tēs
Ag-rop-y′-rum*
Ag-rost-em -ma
Ag-ro-stic′-ul-a
Ag-ro′-stis*
Ag-ro′-tis
Ag-yl-oph′-or-a
Ah-ou′-ai
ai-lant-if-ol′-ĭ-a
Ai-lant′-us
Ains-læ′-a
Ains-worth′-ĭ-i
A-i′-phan-ēs
A-i′-pi
Ai′-ra
Aitch-is-o′-ni
Ai-to′-nĭ
*Ai-to′-nĭ-a**
Ai-to-nĭ-a′-na
a-i-zo-i′-dēs
A-i-zo′-on*
Aj-a′-cis
aj-an-en′-sis
A′-jax
Aj-u′-ga*
Ak-e′-bĭ-a
Al-ang-ĭ-a′-cĕ-æ
Al-ang′-ĭ-um
Al-ar-co′-nĭ-a
al-a′-ta
al-at-av′-ic-us
Al-at-ern′-us
Al-at′-ip-ēs
al-a′-tus
al′-ba
al-bel′-lus
Al-bert′-i
al-besc′-ens
al′-bic-ans
al-bic-aul′-is
al′-bid-a
al-bid′-ul-um
al-bif-lo′-rum
al′-bif-rons
al-bin-a′-tum
al-bis-pi′-na
al-biv-e′-nĭ-a
Al-biz′-zĭ-a
al-bo-cinc′-ta
al-bo-spi′-ca*
al-bo-sti′-pes*
Al-bu′-ca
al′-bul-us
al′-bus
Al-can′-na
Al′-cĕ-a
Al-chem-il′-la
al-chem-ill-ŏ-i′-dēs
alc-ic-orn′-ĕ
alc-ŏ-i′-dēs
Al-coqu-ĭ-a′-na
Ald′-ĕ-a
Al-ec-tor-ol′-oph-us*
Al-e′-grĭ-a
al-epp′-ic-um
Al-et′-ris
al-et-rŏ-i′-dēs

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *pā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Al-eu-ri′-tēs
Al-eu-ri-top′-sis
Al-ex-an′-dræ
Al-ey-ro′-dēs
Al′-ga
Al′-gæ
Al-gar-o′-bĭ-a
al-gar-ven′-sĕ
al-ge′-rĕ-en′-sis
al′-gid-a
Al-ha′-gi
Al-ib-ĕr′-tĭ-a
Al-ic-ast′-rum
Al-ic′-ĭ-æ
al-ĭ-e′-num
Al-ip′-sa
Al-is′-ma
Al-is-ma′-cĕ-æ
al-is-mæ-fol′-ĭ-um
Al-kek-eng′-i
All-am-an′-da
All-an-to′-dĭ-a
All-ardt′-ĭ-a
all-ĭ-a′-cĕ-a
All-ĭ-a′-rĭ-a
All-ĭ-a′-rĭ-æ
All′-ĭ-i
All-ĭ-o′-nĭ-i
All′-ĭ-um
All-ob-rog′-ĭ-a
All-och′-lam-ys
all-oph-yll′-a
All-oph-yll′-us
All-op-lec′-tus
All-os-o′-rus*
Al-mei′-dē-a
al-nif-ol′-ĭ-a
Al′-nus
Al-oc-as′-ĭ-a
Al′-ŏ-e*
al-ŏ-i′-dēs
al-ŏ-if-ol′-ĭ-um
Al-o′-mĭ-a
Al-o′-na
Al-on-so′-a
al-o-pec-u-rŏ-i′-dēs
al-o′-pec-u-rŏ-i′-dĕ-um
Al-oph′-ĭ-a
Al-oy′-sĭ-a
al-pest′-ris
al-pi′-na
Al-pi′-nĭ-a
Al-sob′-ĭ-a
Al-so-dei′-a
Al-soph′-il-a
Al-sto′-nĭ-a
Al-strö-mer′-ĭ-a
al-tac-*le*-ren′-se
Al-tag-a′-na
al-ta′-ic-a
al-ta′-ĭ-en′-sĕ
Alt-en-stei′-nĭ-i
al-tern′-ans
Al-tern-anth-e′-ra
Al-tern-a′-rĭ-a
Al-tern-a′-rĭ-æ
al-tern-if-ol′-ĭ-a
Al-thæ′-a
al-thæ-if-ol′-ĭ-a
al-thæ-ŏ-i′-dēs
Al′-tic-a
al′-tif-rons
al-tiss′-im-a
Al-u-cit-i′-na
al-ut-a′-cĕ-um
al-wart-en′-sis
Al-y′-pum
Al-yss′-um
am-a′-bil-is
Am-al′-ĭ-a
Am-al′-ĭ-æ
Am-al′-ĭ-as
Am-an′-ca-ēs
Am-an-i′-ta
am-a′-ra
Am-ar-ant-a′-cĕ-æ
Am-ar-ant′-us
am-a-ric-au′-lis
am-a-ris-sim′-a
Am-ar-yl-lid′-ĕ-æ
am-ar-yl′-lid-if-ol′-ĭ-a
Am-ar-yl′-lis
Am-as-o′-nĭ-a
am-as-o′-num
am-big′-ŭ-el′-la
am-big′-u-um
Am-bly-an-the′-ra
am-bly′-od-on*
am-boi-nen′-sĕ
am-boy-nen′-sis
Am-bros-i′-nĭ-a
am-bros′-ĭ-ŏ-i′-dēs
Am-el-an′-chĭ-er
am-el-lŏ-i′-dēs
Am-el′-lus
am-er-ic-a′-na
Am-er-im′-non
Am-er-im′-num
am-eth-ys-ti′-na
am-eth-ys-tog-lōs′-sa
Am-hers′-tĭ-a
Am-hers′-tĭ-æ
Am-hers′-tĭ-a′-na
Am-ĭ-anth′-em-um
Am-i′-cĭ-a
am-il′-la-ris
Am-mob′-ĭ-um*
Am-moch′-ar-is*
Am-mod-en′-dron
Am-mog-e′-tōn*
Am-mo-ni′-ac-um
Am-myr′-sin-e
Am-œ′-bæ
am-œ′-na
am-œ′-nul-a
Am-o′-moph-yl′-lum
Am-o′-mum
Am-orph′-a
am-orph-ŏ-i′-dēs
Am-orph′-oph-al′-lus
am-pel-oph′-ag-um
Am-pel-op′-sis
Am-pel-os-ic′-ŷ-os
am-phib′-ĭ-um
Am-phib-lem′-ma
Am-phib-le′-stra
Am-phic-ar-pæ′-a
am-phic-ar′-pos
Am-phic′-om-e
Am-phil-ob′-ĭ-um*
Am-phil-oph′-ĭ-um
Am-phi′-ōn
Am-phip′-od-a
am-phor-a′-ta
am-phos-te′-mōn*
am′-pla
am-plex′-ic-au′-lis
am-plĭ-a′-tus
am-plif-lo′-rum
am-plis′-sim-um
am-pul-la′-cĕ-us
am-pul-la′-rĭ-a
Am-so′-nĭ-a
am-ur′-en-sĕ
Am-yg′-dal-i
am-yg′-dal-if-ol′-ĭ-a
am-yg′-dal-i′-na
am-yg′-dal-ŏ-i′-dēs
Am-yg′-dal-op′-sis
Am-yg′-dal-us
am-yl-ob-ac′-ter
am-yl-ov′-or-us
Am-yr-id-a′-cĕ-æ
Am′-yr-is
An-ac-amp′-ser-os
An-ac-amp′-tis
an-ac-anth′-a
An-ac-ar-dĭ-a′-cĕ-æ
An-ac-ar′-dĭ-um
An-ad-e′-nĭ-a
An-ag-al′-lis
An-ag′-yr-is
An-a′-nas
An-a-nas′-sa
An-anth′-er-ix
An-ap-el′-tis
An-ar-rhi′-num
An-ar′-sĭ-a
An-as-tat′-ic-a
an′-ceps
An-chi-e′-tĕ-a
Anch-is′-tĕ-a
Anch-om′-an-ēs
anch-or-if′-er-a
An-chu′-sa
an-chu′-sæ-fol′-ĭ-a
an-chu-sŏ-i′-dēs
An-chu-sop′-sis
an-cil′-la
An-cyc-loc′-lad-us
An-cyc-log′-yn-e*
An-der-so′-ni
An-der-so′-nĭ-a
An-der-so-nĭ-a′-num
An-der-so′-nĭ-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

and-ic′-ol-a
and-ig′-en-um
and′-in-um
An′-*di*-*ra*
An-drach′-ne
an-drach′-nŏ-i′-dēs
An′-*dre*-æ
An-*dre*-a′-num
An-*dreu*′-*si*-a
An-*drew*′-*sĭ*-i
An-*drew*-si-a′-na
An-*drew*′-*sĭ*-i
An′-dric-us
An-*dri*-*eux*′-*ĭ*-i
An-droc-ym′-*bĭ*-um
an-drog′-yn-us
An-drol′-ep-is
An-drom-ach′-*ĭ*-a
An-drom′-ed-a
an-drom′-ed-æ-flo′-ra
an-drom′-ed-æ-fol′-*ĭ*-a
An-drop-o′-gŏn*
An-dros′-ac-e*
an-dros-ac′-*ĕ*-a
an-dros-æ′-mif-ol′-*ĭ*-um
An-dros-æ′-mum
An-dros-teph′-*ĭ*-um*
An-dry′-al-a
An-ec-och-i′-lus
An-ei-le′-ma
an-*ei*-*ten*′-*sĕ*
An-e′-*mĭ*-a*
An-e′-mid-ic′-*tў*-on
An-e′-*mĭ*-op′-sis
an-em-o′-næ-flo′-rus
an-em-o′-næ-fol′-*ĭ*-um
An-em-o′-ne*
An-em-o′-nēs
an-em-o′-nif-ol′-*ĭ*-us
an-em-o′-*nŏ*-i′-dēs
An-em-o-nop′-sis
An-em-op-æg′-*m*ɪ
an-e′-thif-ol′-*ĭ*-a
An-e′-thum
an-frac-*tŭ*-o′-sum
An-gel′-ic-a
An-*gel*-*o*′-*nĭ*-a
An-gi-anth′-us
An-gi-op′-ter-is
an-*go*′-*len*-*sĕ*
An-goph′-or-a
An-*græ*′-*cum*
an-guic′-id-a
an-guif′-ug-a
An-guil-lul′-id-æ
ang-ui′-na
an-guin′-*ĕ*-a
An-*gui*′-*vi*
ang-ul-a′-ris
ang-ul-a′-ta
ang-ul′-ig-er
Ang-*ul*-*o*′-a
ang-ul-o′-sa
An-gu′-*rĭ*-a
an-gus-ta
an-gus-ta′-tus
an-gus-tif-ol′-*ĭ*-a
an-gus′-*tĭ*-or
an-gus′-*tĭ*-or-a′-na
an-gus-tip-in′-nul-a
An-hal-o′-*nĭ*-um
A′-*nĭ*-a
An-ig-oz-anth′-us
An′-*il*
An-is-anth′-us*
an-i-sa′-ta
An-is-och-i′-lus
An-is′-od-us
An-is-og-o′-*nĭ*-um*
an-is-ol′-ob-a
An-is-ol′-ob-us
An-is-om′-el-ēs
An-is-op-et′-al-um
an-is-oph-yl′-lus
An-i′-sum*
An-*næ*′-i
An-*nes*-*le*′-i
an-no′-sus
an-no′-tin-um
an′-*nŭ*-a
an-nul-a′-*rĕ*
an-nul-a′-tum
an-nul′-ip-ēs
An-œc′-toch-i′-lus*
An′-om-a
an-o′-mal-a
An-om-ath-e′-ca*
An-om-orh-ē*g*′-*mĭ*-a
An-*o*′-*na*
An-o-na′-*cĕ*-æ
An-o′-ny*m*-os
an-op-et′-al-um
An-op-lanth′-us
An-op-loph′-yt-um*
An-op′-ter-us
an-os′-mum
An-*sel*′-*lĭ*-a
An-ser-i′-na
an-ser-i′-næ-fol′-*ĭ*-a
ant-arc′-tic-a
An-ten-na′-*rĭ*-a
An-ten-nif′-er-a
Ant-eu-phorb′-*ĭ*-um
ant-hel′-*mĭ*-a
Anth′-em-is*
an-them-*ŏ*-i′-dēs
an-the′-ra-rum
anth-er-ic′-lis
Anth-er′-ic-um
an-the-ro′-sa
an-the-ro′-*tēs*
Anth-id′-*ĭ*-um
Anth-oc-er′-cis
Anth-od′-on
Anth-ol-o′-ma*
Anth-ol-y′-za
Anth-om-y′-*ĭ*-a
Anth-on′-om-us
Anth-op-o′-gŏn
An′-thor-a
Anth-os-per′-mum
Anth-ot-ax′-is
Anth-ot-ax′-um
Anth-ox-anth′-um
an-thris′-cif-ol′-*ĭ*-a
An-thris′-cus
an-thro′-poph-ag-o′-rum
an-thro-poph′-or-a
An-thu′-*rĭ*-um
An-thyl′-lis
an-*tĭ*-ac-anth′-a
An-*ti*-*a*′-*ris*
An-tic-le′-a
an-tid-ys′-en-ter′-ic-a
An-tig-o′-non*
An-tig-ram′-me
an-*til*-*la*′-na
An′-*tĭ*-op-a
an-*tĭ*-*og*-*u*′-en′-sis
an-tip′-od-a
an-ti′-qua
an-ti-quo′-rum
An-tir-rhi′-*nĕ*-æ
an-tir-rhi′-*nŏ*-i′-dēs
An-tir-rhi′-num
An-tis′-pil-a
An-to′-*nĭ*-a
An-troph′-*ў*-um
ant-*werp*-en′-sis
anx-*an*′-tic-a
A-o′-tus
Ap-at-u′-*rĭ*-a
Ap-*e*′-*i*-*ba*
ap-en-ni′-na
Ap-en′-ul-a
ap-er′-ta
ap-er′-tif-lo′-ra
ap-et′-al-a
Aph-el-an′-dra
aph-el-an′-dræ-flo′-ra
Aph-el-ex′-is
Aph′-id-ēs
Aph-il-oth′-rix
Aph′-is
Aph-rod-i′-te
Aph-roph′-or-a
aph-yl′-la
Aph-yl-lanth′-ēs
ap-ic-a′-ta
ap-ic′-id-ens
Ap-ic′-ra
ap-ic-ul-a′-tum
ap-if′-er-a
ap-if-or′-mis
ap′-*ĭ*-i
ap′-*ĭ*-i-fol′-*ĭ*-um
Ap-*in*-*a*′-*ga*
ap-*ĭ*-oph′-il-a
Ap′-*ĭ*-os
Ap-*ĭ*-os-per′-mum
Ap′-is
Ap′-*ĭ*-um*
Ap-lec′-trum
Ap-lop-ap′-pus
Ap-loph-yl′-lum

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā*′-lmist; ĕ as in sl*ĕn*′-der; ē as in v*ē*′-ined; ĭ as in th*ĭn*; ī as in mach-*ī*′-nist; ŏ as in r*ŏt*′-ten; ō as in v*ō*′-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū*′-ler; ў as ĭ; ў as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ap-lot-ax′-is
Ap-oc-yn-a′-cĕ-æ
Ap-oc′-yn-um*
ap′-od-a
ap-od-anth′-us
Ap-on-og-e′-ton
Ap-or-e′-tic-a
Ap-or′-ĭ-a
ap-pen-dic-ul-a′-tum
ap-plan-a′-ta
Applĕ-by-a′-na
ap-plic-a′-ta
ap′-ter-a
Ap-ter-anth′-ēs
Ap-to-sim′-ĕ-æ
Ap-to′-sim-um
ap-ur-en′-sis
a′-pus
Aq-uār′-tĭ-a
aq-uat′-ic-us
aq-uat′-il-is
aq′-uĕ-um
Aq-uif-ol′-ĭ-a′-cĕ-æ
Aq-uif-ol′-ĭ-um
Aq-uil-e′-gĭ-a
aq-uil-e′-gif-ol′-ĭ-um
aq-uil-i′-na
aq-uo′-sus
ar-ab′-ic-a
ar-ab′-id-if-lo′-rum
ar-ab-id′-ĭ-ŏ-i′-dēs
Ar′-ab-is*
Ar-a′-cĕ-æ
Ar′-ach-is
Ar-ach-nan′-the
Ar-ach-nim-orph′-a
Ar-ach-ni′-tēs
ar-ach-ni′-tis
ar-ach-nŏ-i′-dēs
ar-ach-nŏ-i′-dĕ-um
Ar-a′-lĭ-a
Ar-a′-lĭ-a′-cĕ-æ
ar-a-nif′-er-a*
Ar-ar-a′-ti
Ar-au-ca′-rĭ-a
Ar-au-ca′-ri-ĕ-æ
Ar-au-ca′-rĭ-ŏ-i′-dēs
Ar-au′-ja
ar-bor′-e-a
ar-bor-es′-cens
Ar-bus′-cul-a
ar′-but-if-ol′-ĭ-a
ar′-but-ŏ-i′-dēs
Ar′-but-us*
Ar′-ce-i
Arch-an-gel′-ic-a
Arch′-er-i
Arch-er-ĭ-a′-na
Arch-on′-toph-œ′-nix
ar-col-a′-ta
Arc′-tĭ-a
arc′-tic-a
Arc-tos-taph′-yl-os*
Arc-toth-e′-ca
Arc-to′-tis
Arc-tu′-rus
ar-cŭ-a′-ta
ar′-dens
Ar-dis′-ĭ-a
Ar-do-i′-ni
Ard-ŭ-en-nen′-sĕ
Ard-ŭ-i′-na
Ar-e′-ca
Ar-e-na′-rĭ-a
Ar-e-na′-rĭ-æ
Ar-en-berg′-ĭ-a
Ar-en-berg-ĭ-a′-na
Ar-en′-ga
ar-e-no′-sa
ar-ĕ-ol-a′-tum
Ar-eth-u′-sa
Ar-e′-tĭ-a
ar-e′-tĭ-ŏ-i′-dēs
Ar′-gan
Ar-gan′-ĭ-a
Ar-gem-o′-ne*
ar-gen-tæ-flo′-ra
ar-gen-ta′-ta
ar-gen′-tĕ-us
Ar-gol-as′-ĭ-a
ar-goph-yl′-lus
ar-gos′-path-a*
ar-gu-nen′-se
Ar′-gus
ar-gu′-ta
ar-gyr-æ′-a
Ar-gyr-ei′-a
ar-gyr-i′-tes
Ar-gyr-och-æ′-ta
ar-gyr-on-eu′-rus
ar-gyr-oph-yl′-la
Ar-gyr-oph′-yt-on
ar-gyr-os-tig′-ma
Ar-gyr-ox-yph′-ĭ-um
A′-rĭ-a
ar′-id-us
ar-ĭ-et-i′-na
a-rif-ol′-ĭ-a
Ar′-i-ōn
A-ris-æ′-ma
Ar-is′-ar-um
ar-is-ta′-ta
Ar-is′-tĕ-a
Ar-is′-tol-och′-ĭ-a*
Ar-is′-tol-och-ĭ-a′-cĕ-æ
Ar-is′-tom-en′-ĭ-a
ar-ist-o′-sa
Ar-ist-ot′-el-a*
Ar-ist-ot-el′-ĕ-a
Ar-ist-ot-el′-ĭ-a
Ar-i′-za
Ar-ju′-na
Ar-mad-il′-lo
ar-ma′-tus
Ar′-men-a
Ar-men′-ĭ-ac-a
Ar-me′-rĭ-a
ar-mil-la′-ris
ar-mil-la′-ta
Ar-min′-ĭ-i
Ar-mit-ag-e-a′-nus
Ar-mor-a′-cĭ-a
Ar-ne′-bĭ-a
Ar′-nic-a
Ar-nop-o′-gōn
Ar-not′-ĭ-i
Ar-not-tĭ-a′-na
A-roi′-dĕ-æ
ar-o-mat′-ic-um
Ar-o′-mĭ-a
Ar-o′-nĭ-a
Ar-o-ni′-cum*
Ar-poph-yl′-lum
Ar-rac-a′-cha
ar-rag-on-en′-sis
ar-rec′-ta
Ar-rhos-tox′-yl-um
Art-ab-ot′-rys
Art-an-e′-ma
Art-anth′-e
Art-em-is′-ĭ-a
Arth-op′-ter-is
Arth-roph-yl′-lum
Arth-rop-od′-ĭ-um*
Arth-rop′-ter-is
Arth-ros-tem′-ma
Arth-rot-ax′-is
Arth-ur-ĭ-a′-num
ar-tic-ul-a′-ta
Ar-toc-ar′-pĕ-æ
ar-toc-ar′-pif-ol′-ĭ-a
Ar-toc-ar′-pus
A′-rum
A-run′-cus
ar-un-din-a′-cĕ-a
Ar-un-din-a′-rĭ-a
Ar-un′-do
ar-va′-lis
ar-ven′-sis
ar-ver-nen′-se
Ar-vic′-ol-a*
ar-vi′-na
Ar-yt-e′-ra
Arz′-æ
As-af-œt′-id-a
A-sag-ræ′-a
As′-aph-ēs
as-ar-if-ol′-ĭ-um
As-ar-i′-na
as′-ar-ŏ-i′-dēs
As′-ar-um
as-cal-o′-nic-um
As-car-ic′-id-a*
as-cen′-dens
As′-cĭ-um
As-cle′-pĭ-ad-a′-cĕ-æ
as-cle′-pĭ-ad′-ĕ-a
As-cle′-pĭ-ad′-ĕ-æ
As-cle′-pĭ-as
As-coch-y′-ta
As-com-yc-e′-tēs*
as-cot-en′-sis
As′-cyr-um
As′-cyr-on
as-el′-lif-or′-mis

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

as-el′-lus
As-er-i′-na
Ash-bur-to′-nĭ-æ
a-si-a′-tic-a
As-im′-in-a
As-o′-ca
as-pal′-ath-ŏ-i′-dēs
As-pal′-ath-us
as-par′-ag-if-ol′-ĭ-a
as-par-ag-ŏ-i′-dēs
As-par′-ag-us
As-pa′-sĭ-a
As-peg-re′-nĭ-a
as′-per-a
as-per-a′-ta
as-per-ic-au′-lis
as-per-if-ol′-ĭ-i
as-per′-rim-us
as-per′-sum
As-per′-u-la
As-phod-el-i′-ne
as-phod-el-ŏ-i′-dēs
As-phod′-el-us*
as-pid-ĭ-ŏ-i′-dēs
As-pid-ĭ-o′-tus
As-pid-is′-tra
As-pid′-ĭ-um
as-ple′-nif-ol′-ĭ-a
as-ple′-nĭ-ŏ-i′-dēs
As-ple′-nĭ-um
As-saf-œ′-tid-a
as-sam′-ic-a
as-sim′-il-e
As-so′-nĭ-a
as-sur′-gens
As-tart′-ĕ-a
As-tel′-ma
As-teph′-an-us
As′-tēr*
As-ter-ac-anth′-a
As-ter-a′-cĕ-æ
As-ter-anth′-em-um
As-ter-is′-cus
As-ter-oc-eph′-al-us
as-ter-ŏ-i′-des
As-ter-o′-ma
As-ter-op′-ter-us
As-ter-os-tig′-ma
asth-mat′-ic-a
As-til′-be
as-til-bŏ-i′-dēs
As-trag′-al-us
As-tran′-tĭ-a
As-trap-æ′-a
As-troc-ar′-ŷ-um*
As-trol-ob′-ĭ-um*
As-trol-o′-ma
As-troph′-yt-um*
As-ys-ta′-sĭ-a
At-ac′-cĭ-a
At-al-an′-ta
At-al-anth′-us
At-al-an′-tĭ-a
At-am-as′-co
a′-ter

Ath-a′-lĭ-a
Ath-al′-mus
Ath-am-an′-ta
ath-am-an′-tic-um
Ath-an-as′-ĭ-a
Ath-er-os-per′-ma
Ath-er-os-per′-mĕ-æ
Ath-e-ru′-rus*
Ath-lĭ-anth′-us
Ath′-ŏ-us
Ath-rix′-ĭ-a
Ath-rot-ax′-is
ath-rox-ŏ-i′-dēs
Ath-ruph-yl′-lum
Ath-yr′-ĭ-um
At′-kin-si
At-kin′-sĭ-i
At-kin-so′-ni
At-kin-so′-nĭ-a′-na
at-lan′-tic-um
At-oc′-ĭ-on
At-om-a′-rĭ-a
a′-tra
At-rag′-en-e
a-tra′-ta
At′-rip-lex
at-rip-lic′-if-ol′-ĭ-um
at-rip′-lic-is
At′-rop-a
At′-rop-os
a′-tro-pur-pur′-ĕ-a
a′-tro-rub′-ens
a′-tro-san-guin′-ĕ-a
a′-tro-vir′-ens
At-tal-e′-a
at-ten-ŭ-a′-ta
at-ten-ŭ-if-ol′-ĭ-um
at′-tic-a
Au-be′-ri
Au-ble′-tĭ-a
Au-ble′-tĭ-i
Au-brĕ-e′-tĭ-a
Au-che′-ri
Au-che′-rĭ-a′-na
Auck-land′-ĭ-i
*Au′-cub-a**
au′-cub-æ-fol′-ĭ-um
au′-cub-if-ol′-ĭ-a
Au-cup-a′-rĭ-a
Au-dib-ēr′-tĭ-a
Au-dou-in′-ĭ-a
Aug′-ĕ-a
au′-gus-ta
au-gus-ta′-ta
au-gus-tif-ol′-ĭ-um
Au-gus-ti′-na
au-gus-tis′-sim-um
Au′-lac-oph-yl′-lum
Au-lac-os-per′-mum
Au′-lax
au′-lic-a
aur-an′-tĭ-a
Aur-an-tĭ-a′-cĕ-æ
aur-an′-tĭ-ac-um
aur-ant-ĭ-a′-rĭ-a

au-ra′-rĭ-um
aur-a′-ta
au′-rĕ-a
Au-re′-lĭ-a
Au-re-lĭ-a′-na
au′-rĕ-o-fla′-vum
au′-rĕ-ol-a
aur-ic′-om-us
Aur-ic′-ul-a
aur-ic′-ul-æ-fol′-ĭ-a
aur-ic-ul-a′-rĭ-a
aur-ic-ul-a′-ta
aur-if′-lŭ-a
aur-if-or′-mis
au-rĭ′-ta
au-ro′-sum
Au-stin-ĭ-a′-na
aus-tra-las′-ic-um
aus-tra′-lĕ
aus-tra′-lĭ-a′-na
aus-tra′-lis
aus′-trĭ-ac-a
aus′-tro-cal-e-don′-ic-a
au-tum-na′-le
Av-el-la′-na
Av-e′-na
av-e-na′-cĕ-um
Av-er-rho′-a
av′-ic-eps
av-ic-ul-a′-re
av′-ĭ-um
Ax-il-la′-rĭ-a
ax-il-la′-ris
ax-il-lif-lo′-ra
Az-ad-ir-ach′-ta
Az-al′-ĕ-a*
az-al-ĕ-ŏ-i′-dēs
Az-a′-ra
Az-a′-rol-us
Az-ed′-ar-ach
Az-i′-ma
Az-ol′-la
az-or′-ic-a
az-u′-rĕ-us

Bab-ĭ-a′-na
Bab-ing-to′-nĭ-a
bab-or-en′-sis
bab-yl-o′-nic-a
ba-ca′-ba
bac′-cans
bac-ca′-tum
bac-char-if-ol′-ĭ-us
Bac′-char-is
Bac′-chus
bac-cif′-er-a
Bac-cil′-lus
Bach-em-ĭ-a′-na
bac-il-la′-ris
Back-hous′-ĕ-i
Back-hous′-ĭ-a
Back-hous′-ĭ-a′-na
Bac-o′-nĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Bac-te′-rĭ-um
Bac′-tris
Bac-ul-a′-rĭ-a
bac-ul-if′-er-a
Bad-am′-ĕ-a
Bœ -a
Bæck′-ĕ-a
Bæ-ob-ot′-rys
Ba-er′-ĭ-a
bæt′-ic-a
Bah-i′-a
bah-i-en′-sis
Bah′-ma
Baik-ie′-i
Bail-lo′-ni
Baines′-ĭ-i
Bain′-ĭ-i
Ba′-ker-i
Ba-ker-ĭ-a′-na
Bal-ang′-has
Bal-an′-in-us
Bal-an-i′-tēs
Bal-an′-ĭ-us
Bal-an-op′-ter-is
Bal-an′-sæ
Bal-an′-tĭ-um
Bal-bi′-sĭ-a
Bal-bi′-sĭ-a′-na
Bal-bi′-sĭ-i
bal-den′-sis
Bal-der′-ĭ-am-æ
Bal-der′-ram-æ
Bal-ding-e′-ra
bal-ĕ-a′-ric-a
Bal-four′-ĭ-a
Bal-four-ĭ-a′-na
Bal-four′-ĭ-i
bal-ka′-na
Bal-lan-ti′-nĕ-i
Bal-lo′-ta
Bal-mor-ĭ-a′-na
bal-sam′-ĕ-a
bal-sam-if′-er-a
Bal-sam′-ĭ-i
Bal-sam′-in-a
bal-sam′-in-æ-flo′-ra
Bal-sam-in′-ĕ-æ
Bal-sam′-it-a
Bal-sam′-od-end′-ron
Bal′-sam-um
bal′-tic-a
Bam-bu′-sa
bam-bu′-sæ-fol′-ĭ-a
bam-bu-sŏ-i′dēs
Ban-a′-ra
ban-at′-ic-us
Ban-crof′-tĭ-i
Ban-dhu′-ca
Ban-is-te′-ri
Ban-is-te′-rĭ-a
Bank′-sĭ-a
Bank′-sĭ-æ
Bank-sĭ-a′-na
Bank-sĭ-an′-æ
Bank′-sĭ-i

Baph′-ĭ-a
baph-ic-an′-tum
Bap-tis′-ĕ-a
Bap-tis′-tĭ-i
Bar-aq-ui-a′-na
Bar-aq-uin′-ĭ-i
Bar-bac-e′-nĭ-a
bar-bad-en′-sis
Bar′-bă-Jov′-is
bar′-bar-a
Bar-bar-e′-a
bar-ba′-ta
bar-ba′-tul-um
Bar′-ber-æ
Bar-ber′-ĭ-æ
Bar′-ber-ĭ-a-num
Bar-bi-e′-rĭ-a
bar-big′-e-ra
bar-bul-a′-ta
bar-cin-o′-nen-sis
Bar-clay-a′-na
Bar-id′-ĭ-us
Bar-il-le′-ti
Bar-ker′-i
Bar-ker′-ĭ-a
Bar-ker-ĭ-a′-na
Bark-haus′-ĭ-a
Bar′-kly-a
Bar′-kly-i
Bar′-læ
Bar-læ-a′-na
Bar-le′-rĭ-a
bar-le′-rĭ-ŏ-i′-dēs
Bar′-lĭ-a
Bar-nad-e′-sĭ-a
Bar-nard′-ĭ-a
Bar-ne′-sĭ-i
Bar′-om-etz
Bar-os′-ma
Bar-rald-ei′-a
Bar-rel-lĭ-e′-ri
Bar-rel′-lĭ-i
Barr′-ĭ-i
Bar-ring-to′-nĭ-a
Bar-ring-to′-nĭ-æ
Bar-rot′-ĭ-a
Bar′-ter-i
Bar-the-rĭ-a′-na
Bart-lin′-gĭ-a
Bar-tol-i′-na
Bar-to′-nĭ-a
bar-to-nĭ-ŏ-i′-dēs
Bar′-ў-a
Bar-ў-an′-dra
Bar-ў-os′-ma
bar-yst′-ach-ys
Bas-el′-la
Bas-el-la′-cĕ-æ
bas-il-a′-ris
Bas-il′-ic-um
Bas′-sĭ-a
Bas′-sĭ-i
Bas-so′-vĕ-a
Bat-a′-tas
Bat-au′-a

Bate-man-ĭ-a′-num
Bate-mon′-ni
Bate-man′-nĭ-a
Bat-o′-nĕ-us
Batsch′-ĭ-a
Bau-dou-in′-ĭ-i
Bau-e′-ra
Bau-e′-ri
Bau-e-rĭ-a′-na
Bau-hin -ĭ-a
Baus′-ĕ-i
bav-ar′-ic-a
Bax-ter′-i
Bay-field′-ĭ-i
Bay′-lĭ-æ
Bear-ley-a′-na
Bea-to′-nĭ-a
Bea-to′-nĭ-i
Beat-so′-nĭ-a
Beau-car′-nĕ-a
Beau-for′-tĭ-a
Beau-har-noi′-sĭ-a
Beau-mon′-tĭ-a
Beau-mon-tĭ-a′-na
Beau-mon′-tĭ-i
Bec-cab-un′-ga
Bec-ca′-rĭ-i
Be′-cĭ-um
Bed-do′-mĕ-i
Bed-for′-dĭ-a
Bed-for-dĭ-a′-na
Bed-ing-hau′-sĭ-i
Bef-a′-rĭ-a
Beg-o′-nĭ-a
Beg-o′-nĭ-a′-cĕ-æ
beg-o′-nĭ-æ-fol′-ĭ-a
Beg-o′-nĭ-el′-la
Beij-er-inck′-ĭ-i
Bej-a′-rĭ-a
Bel-am-can′-da
Bel-an′-ger-i
Bel-e′-nĭ-a
belg′-ĭ-i
bel′-la
Bel-lad-on′-na
Bel-lar′-dĭ-a
Bel-len-de′-ni
Bel-lev-a′-lĭ-a
Bel-leym′-ĕ-i
Bel-lid-ĭ-as′-trum
bel-lid-if-lo′-rus
bel-lid-if-ol′-ĭ-um
bel-lid-ĭ-ŏ-i′-dēs
Bel-li′-nĭ-a
bel-li′-num
Bel′-lis
Bel′-lĭ-um
bel′-lul-a
bel′-lum
Bel-mo-rĕ-a′-na
Bel-on-i′-tēs
Bel-op-er′-on-e*
bel-oph′-or-us
bel-oph-yl′-lum
Bel-ot′-tĭ-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Bel-va′-la
Bel-vi′-shi-a
bem-be′-cif-or′-mis
Ben-a′-ry-i
Ben-eb′-er-a
ben-ed-ic′-tus
ben-gha-len′-sis
ben-jam-i′-na
Ben-net′-i-a
Ben-net′-ti-i
Ben-so′-næ
Ben-so′-ni
Ben-so′-ni-æ
Ben′-tham-i
Ben-tham′-i-a
Ben-tham-i-a′-na
Ben-tinck′-i-a
Ben-zo′-in
Ber-ār′-di
Ber-ār′-di-a
Ber-ber-id-a′-ce-æ
Ber-ber′-id-is
Ber-ber-id-op′-sis
ber-ber-if-ol′-i-a
Ber′-ber-is
Ber-chem′-i-a
Berg-e′-ra
Berg-i-a′-na
Berg-man-ni-a′-na
Berk-eley′-i
Berk-hey′-a
Berk-ley′-i
Ber-land′-i-e-ri-a′-na
ber-mu′-di-a′-na
Ber-nār′-di
Ber-nār-di-a′-na
Ber-nay′-si-i
Bern-hard-i-a′-num
Ber-ni-e′-ri-a′-na
Ber-ter-o-a′-na
Ber-thel-o′-ti
Ber-thel-o-ti-a′-nus
Ber-thol-le′-ti-a
Ber-ti′-ni
Ber-tol-o′-ni-a
Ber-tol-o′-ni-i
Ber-ze′-li-a
Bes-chor-ne′-ri-a
Bes-le′-ri-a
bes-sar-ab′-ic-us
Bes-se′-ra
Bes-se′-ri-a′-na
Bes-so′-ni
Bes-so′-ni-a′-na
Be′-ta
be-ta′-ce-um
be′-tæ
Bet′-cke-a
Beth-el′-li-i
Beth-u′-ne-a′-num
Be′-tle
Bet-on′-ic-a
bet-on′-ic-æ-fol′-i-a
bet-on-ic-o-i′-des
Bett-zich-i-a′-na
Bet′-ul-a
bet′-ul-æ-fol′-i-a
Bet-ul-e′-æ
Bet-ul-e′-ti
bet-ul-if-ol′-i-a
bet-ul-i′-na
bet-ul-o-i′-des
Bet′-ul-us
Beu′-thi-i
Bey-rich-i-a′-num
Bey-rich′-i-i
Bhoj-pat′-tra
Bi-an′-ce-a
bi-ar-tic-ul-a′-tum
Bi-a′-rum
Bi-as-sol-et-ti-a′-na
bi-au-ri′-ta
bib-rac-te-a′-ta
bic-al-ca-ra′-ta
bic-al-lo′-sum
bic-am-er-a′-tum
bic-ar-i-na′-ta
bic′-ol-or
bic-on-tor′-tus
bic-or′-nis
bic-or-nu′-tum
Bic-or-o′-na
bic-re-na′-tus
Bic-ton-en′-sis
bic-us′-pis
Bid′-ens
bid-en-ta′-tus
bid-en-tif-ol′-i-a
Bid-wel′-li-æ
Bid-wil′-li
Bie-ber-stei′-ni-a
Bie-ber-stei-ni-a′-num
Bie-ber-stei′-ni-i
bi-en′-nis
bif′-er-um
bif′-id-a
bif-lo′-ra
bif-ol′-i-um
bif-or′-me
Bif-re′-na-ri-a
bif′-rons
bif-ur-ca′-tum
Big-ar-el′-la
Big-el-o′-vi-a
big-ib′-bum
Big-lan-dul-a′-ri-a
big-lu′-mis
Big-no′-ni-a
Big-no-ni-a′-ce-æ
big-no-ni-o-i′-des
Bi′-hai
Bi-hor-el′-la
bij′-ug-a
bil-a′-mel-la′-ta
Bil-im′-bi
Bil-lar-di-e′-ra
Bil-lar-di-e′-ri
Bill-ber′-gi-a
Bill-ber′-gi-æ
bil′-ob-um
bim-ac-ul-a′-tus
bin-a′-ta
bin-er′-vis
bin-oc-ul-a′-re
Bi-oph-yt′-um
Bi-orh-i′-za
Bi′-ot-a*
Bi-o′-ti-a
bip-ar-ti′-ta
bip-et′-al-a
bip-in-na′-ta
bip-in-na-tif′-id-um
bip-in-na′-tip-ar-ti′-tum
bip-unc-ta′-ta
Bir′-che-a
Bir-schel′-li-i
Bis-cu-tel′-la
bis-ec′-tum
bis-er-ra′-ta
bis-pi′-no-sa
Bis-tor′-ta
bit-er-na′-ta
bi-thy′-nic-a
bit-u′-min-o′-sa
biv-al′-ve
biv-it-ta′-tus
Biv-o′-næ
Biv-o-næ′-a
Bix′-a
Bix-in′-e-æ
Black-bur′-ni-a
Black-bur-ni-a′-na
Blæ′-ri-a
Blag-ay-a′-na
Bla′-ke-a
Blan-co′-i
Bland-for′-di-a
bland-for′-di-æ-flo′-rum
blan′-dum
Blan-quær′-ti
Blat′-ta
Blat-ta′-ri-a
Ble-chi-a′-na
blēch-nif-ol′-i-a
blēch-no-i′-des
Blēch′-num
Ble′-chum
Blee-ke′-ri-a
Blen-noc-am′-pa
Ble′-o
bleph-ar-ig-lōt′-tis*
Bleph′-ar-is
bleph-ar-oph-yl′-la
Bleph-il′-i-a
Blet′-i-a
Bligh′-i-a
Bloo-mer-i-a′-num
Blou-do′-vi-i
Blox′-am-i
Blu′-me-a′-num
Blu′-me-i
Blu-men-a′-vi-a
Blu-men-bach′-i-a
Blu′-mi-a
Blunt′-i-i

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Bo-a′-rĭ-a
Bo-bār′-tĭ-a
Boc-co′-ni
Boc-co′-nĭ-a
Bœ′-ber-a
Bœh-me′-ri
Bœh-me′-rĭ-a
Bœn′-ning-hau-se′-nĭ-a
boer-haav′-ĭ-æ-fol′-ĭ-a
Bo-er-haav′-ĭ-i
bog-o′-ten-se
bo-he′-mic-um
Bois-sĕ-e′-ri
Bois-sĕ-e-rĭ-a′-na
Bois-sœ′-a
Boi-vi′-ni
Bo′-je-ri
Bo-je-rĭ-a′-na
Bol-an-de′-ri
Bol-boph-yl′-lum
Bol′-dĕ-a
Bol′-dus
Bo-le′-tus
Bol′-ĕ-um
bol-iv-ĭ-a′-na
bol-iv-ĭ-en′-sis
Bol-lan′-dĭ-æ
Bol′-lĕ-a
Bol-lĕ-a′-na
Bol-wyll-er-ĭ-a′-na
Bol-to′-nĭ-a
Bol-u′-sĭ-i
Bom-a′-rĕ-a
Bom-ba′-cĕ-æ
Bom′-bax
bom-bil-if′-er-a
Bom′-bus
Bom-byc′-id-æ
Bom-byc-i′-na
Bom′-byx
bon′-a
Bon′-a-Nox′
Bo-nap-ār′-tĕ-a
bon-a′-rĭ-en′-sis
Bon-ar-o′-ta
Bo-nar-ot-ĭ-a′-na
Bon-a′-tĕ-a
Bon-av-e′-rĭ-a
Bon-du-el′-li
Bon-gār′-dĭ-a
Bon-jean′-ĭ-a
Bon-nay′-a
Bon-ne′-tĭ-a
Bon-plan-dĭ-a′-na
Bon-plan′-dĭ-i
Boo-thĭ-a′-na
Boo′-thĭ-i
Bor-a-gin-a′-cĕ-æ
Bor-a-gin′-ĕ-æ
Bor-a′-go
Bor-as′-sus
Bor-bo′-nĭ-a
bor-bo′-nic-a
bor-ĕ-a′-lis
Bork-hau-se′-nĭ-a
bor-ne-en′-se
Bor-o′-nĭ-a
Bor-rag-in-ŏ-i′-dēs
Bor-re′-rĭ-a
Bor-re-rĭ-a′-na
Bor-skĭ-a′-na
Borsz-czo′-wi
Bo-rў-a′-num
Bo′-rў-i
Bos′-chĭ-a′-nus
Bos′-cĭ-a
Bos-sel-a′-i
Bos-sĭ-æ′-a
Bos′-trich-us
bos-trych-o′-dēs
Bos-wel′-lĭ-a
Both-wich-ĭ-a′-num
bot-ra′-na
Bot-rў-anth′-us
Bot-rў-ap′-ĭ-um
Bot-rych′-ĭ-um
Bot-rў-od-en′-dron
bot-rў-ŏ-i′-dēs
bot-rў-oph′-or-a
Bot′-rys
bot-ry′-tis
Bot-ter′-ĭ-i
Bot-tĭ-o′-nĕ-a
Bou-cer-o′-sĭ-a
Bou-che′-a
Bou-che-a′-num
Bou-gain-vil′-lĕ-a
Bou-gain-vil′-lĕ-i
Bou-gue′-rĭ-a
Bour-gæ′-i
Bour-ga′-ti
Bour-sĭ-e′-ri
Bous-sin-gaul′-tĭ-a
Bou-tign-ў-a′-num
Bou-vār′-dĭ-a
Bo-vĕ-a′-na
Bow-e′-nĭ-a
Bow-ie′-a
Bow-ie-a′-na
Bow-ie′-i
Bow-ker′-i
Bow′-man-i
Bow-man′-ni
Bow-ring-ĭ-a′-na
Box-al′-lĭ-i
Boy′-lĕ-i
Bcab-ei′-um
brac-am-o-ren′-sis
Brach-el-yt′-ra
brach-ĭ-a′-ta
Brach-ў-ach-i′-ris
brach-ў-an′-drum
brach-ў-an-the′-rum
brach-ў-arth′-ra
brach-yb-ot′-rў-a
brach-yb′-ot-rys
brach-yc-au′-los
brach-yc′-er-as
Brach-ych-i′-tōn*
Brach-yc′-om-e
brach-yc-us′-pis
Brach-yl-æ′-na
Brach-yl-o′-ma
brach-yn-e′-ma
brach′-ў-od-on
Brach-ў-o′-tum
brach-yp-et′-al-um
brach-yph-yl′-la
brach-yp′-od-a
brach-yp′-ter-a
brach-yp′-us
Brach-yrh-yn′-chos
Brach-y′-ris
Brach-ys-e′-ma*
brach-ys-ep′-al-us
Brach-ys′-path-a*
Brach-ys-tel′-ma
brach-ys-te′-mon
Brack-en-ridg′-ĕ-i
Bra-con′-id-æ
brac-tĕ-a′-ta
Brac-tĕ-a′-tæ
brac-tĕ-ol-a′-tus
brac-tĕ-o′-sa
brac-tes′-cens
Brad-bu-rĭ-a′-na
Brad-bu′-rĭ-i
Brad-leĭ′-a
Bra′-hĕ-a
Braĭ′-nĕ-a
Bran-de′-gĕ-i
bras-il-ĭ-a′-na
bras-il-ĭ-en′-sis
Bras-sa′-vo-la
Bras-sa′-vol-æ
Bras′-sĭ-a
Bras′-sic-a
Bras-sic-a′-cĕ-æ
bras′-sic-æ
bras-sic-æ-fol′-ĭ-a
Bras′-sĭ-i
Braŭ′-nĭ-i
bra′-va
Bra-vo′-a
Bray′-a
braz-il-ĭ-a′-na
braz-il-ĭ-en′-sis
Bre′-da
Bre′-dĭ-a
Breh′-mĭ-a
brev-ĭ-ar-is-ta′-ta
brev-ic-au′-lis
brev-if-lo′-rum
brev-if-ol′-ĭ-a
brev′-if-rons
brev-il-a′-min-a′-tum
brev′-ip-ēs
brev-ir-ost′-ris
brev-is-ca′-pa*
brev-is-e′-ta*
brev-is-o′-rum
brev-is-path′-a
Brev-oor′-tĭ-a
Brew-er′-ĭ-i
Brey-nĭ-a′-na

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Pronouncing Dictionary—*continued.*

Brex′-ĭ-a	brў-o′-nĭ-æ-fol′-ĭ-us	*Bur-man′-ni*
Brex-ĭ-a′-cĕ-æ	Brў-o-nop′-sis	*Bur-na′-ti*
Bridg-e′-sĭ-i	Brў-oph-yl′-lum	Bur-sa′-rĭ-a
Bridg-man′-ni	bu-bal-i′-na	*Bur′-ser-a*
brig-an′-tĭ-ac-a	*Bu-ba′-nĭ-a*	*Bur-ser-a′-cĕ-æ*
Brigg′-sĭ-i	*Bu-ba′-nĭ-i*	*Bur′-ser-i*
Brig-no′-lĭ-a	Bu′-bōn	*Bur-ser-ĭ-a′-na*
Bril-lan-tai′-sĭ-a	Bu-bro′-ma	*Bur′-tĭ-i*
bril-lĭ-an-tis′-sim-um	buc-cin-a′-tor	*Bur-to′-nĭ-a*
Bri′-za	Buc′-co	*Bur-to′-nĭ-i*
bri-zæ-for′-mis	buc-co′-sum	*Bus-beck′-ĕ-a*
Broc′-chĭ-a	bu-ceph′-al-a	*Bus-chĭ-a′-num*
Brockle-hurst-ĭ-a′-na	Bu-ceph′-al-on	*Bu′-tĕ-a*
Bro-di-æ′-a	Bu′-cer-as	Bu-tom-a′-cĕ-æ
Brom-el′-ĭ-a	*Bu-chan-a′-ni*	Bu′-tom-us*
Brom-el-ĭ-a′-cĕ-æ	Bu′-cid-a	but-yr-a′-cĕ-a
brom-el-ĭ-æ-fol′-ĭ-a	*Buck-lan′-dĭ-a*	*Bux-bau′-mĭ-a*
Brom-head′-ĭ-a	*Budd-lei′-a*	*Bux-bau′-mĭ-i*
Brom′-us*	*budd-lei-ŏ-i′-dēs*	Bux′-i
bron-chĭ-a′-lis	*Buer′-ger-i*	bux-if-ol′-ĭ-a
Brong-nĭ-ar′-tĭ	*Buett-ne′-rĭ-a*	Bux′-us
Brong-nĭ-ăr′-tĭ-a	*Buett-ne′-rĭ-ĕ-æ*	Byr-son′-im-a
Broo-kĕ-a′-num	Bu′-fo	Bys-trop-o′-gōn
Broo′-kĭ-i	bu-fo′-nĭ-a	Byt-u′-rus
Bro′-sim-um	bu-fo′-nis	byz-an-ti′-num
Brot′-er-a	Bu-glōs′-sum*	
Brough-to′-nĭ-a	bu-gul-if-ol′-ĭ-a	
Brous-son-e′-tĭ-a	bul-bit′-er-a	
Brous-son-e′-tĭ-i	Bul-bi′-ne	*Ca-ap-e′-ba*
Brow-al′-lĭ-a	Bul-bi-nel′-la	*Cab-al-le′-rĭ-a*
Brown′-ĕ-a	bul-boc-o′-dĭ-ŏ-i′-dēs	*Cab-om′-ba*
Brown′-ĭ-i	Bul-boc-o′-dĭ-um	*Cab-om′-bĕ-æ*
Brown′-ĭ-i	Bul-boph-yl′-lum	Cac-a′-lĭ-a
Brown-low′-ĭ-a	bul-bo′-sa	cac-a′-li-æ-fol′-ĭ-a
Bru-an′-tĭ-i	Bul-bos-per′-mum	*Cac-a′-o*
Bru′-cĕ-a	Bul-bos′-tyl-is*	*Cac-a′-ra*
Bru′-chid-æ	bul-la′-ta	*Cac-ou′-cĭ-a*
Bru′-chus	*Bul-len-ĭ-a′-nus*	Cac′-tĕ-æ
Bruck-müll′-ler-i	*Bul-len′-ĭ-i*	Cac-to -rum
Brug-man′-sĭ-a	*Bul-ler-ĭ-a′-num*	Cac′-tus
Bru-ins-man′-ĭ-a	*Bul-li-ăr′-da*	*Cad-am′-ba*
bru-ma′-le	bul-lul-a′-ta	Cæn-op′-ter-is
bru-ma′-ta	*Bu-low′-ĭ-a*	*Ca-en′-wood-ĭ-a′-na*
Bru-nel′-la	*Bu-mal′-di*	Cæ-o′-ma
Brun-fel′-sĭ-a	*Bun-cho′-sĭ-a*	cær-ul′-ĕ-a
Brun-fel′-sĭ-i	*Bun-gĕ-a′-na*	cær-ul-es′-cens
Bru′-nĭ-a	*Bun′-ge-i*	*Cæs-al-pi′-nĭ-a*
Bru-nĭ-a′-cĕ-æ	*Bu-ol-ĭ-a′-na*	*Cæs-al-pi′-nĭ-ĕ-æ*
bru-ni′-ad-ēs	*Bu-o-nap-ăr′-tĕ-a*	cæ′-sĭ-us
bru-nĭ-if-ol′-ĭ-a	Bu′-phan-e	cæs-pit-o′-sum
Brun-lee-sĭ-a′-num	būph-thal-mŏ-i′-dēs	*caf′-fra*
brun′-nĕ-a	Būph-thal′-mum	*caf-fro′-rum*
Brun-now′-ĭ-i	Bu-pleu′-rum	*Cai-ni′-to*
Bru-no′-nĭ-a	*Bur-bid′-gĕ-a*	Cai-oph′-or-a
Bru-no′-nĭ-a′-na	*Bur-bid′-gĕ-i*	*ca′-ja*
Bru-no′-nĭ-i	*Bur-char′-dĭ-a*	*ca-ja′-nif-ol′-ĭ-a*
Bru-no′-nis	*Bur-chel′-li*	*Ca-ja′-nus*
Bruns-vig′-ĭ-a	*Bur-chel′-lĭ-a*	*Ca-ki′-le*
bru′-tĭ-a	*Bur-chel′-lĭ-i*	*Cal-a′-ba*
*Brў′-a**	*bur-for-dĭ-en′-sis*	cal-ab′-ric-a
Brў-anth′-us	*Bur-ger-ĭ-a′-na*	*Cal-ab-u′-ra*
Bry-mer-ĭ-a′-na	*Bur-ges′-sĭ-æ*	Cal-ad-e′-nĭ-a
brў-ŏ-i′-dēs	*Burgs-dorf-fi-a*	*Cal-a′-dĭ-um*
brў-ol-oph′-yt-um	*Bur′-kĕ-i*	Cal′-a-is
Brў-o′-nĭ-a	*Bur-ling-to′-nĭ-a*	Cal-am-ag-ro′-stis

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in .th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ai*n; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Cal-am′-ĕ-æ
Cal-am-in′-tha
cal-am-it-o′-sum
Cal-am-*os-a′-gus*
Cal-am′-pe-lis
Cal′-am-us
Cal-an′-chŏ-e
Cal-an-dri′-nĭ-a
Cal-an′-the
cal-an′-thum
Cal-ath-e′-a
cal-ath-i′-num
cal-ca-ra′-ta
Cal-cĕ-ol-a′-rĭ-ĕ-æ
Cal-cĕ-ol-a′-rĭ-a
Cal-ce′-ol-us
Cal-cit′-ra-pa
Cal-da′-sĭ-a
Cal-da-sĭ-a′-na
Cald-clu′-vĭ-a
Cal′-ĕ-a*
*Ca-le-a′-na**
Cal-ec-ta′-sĭ-a
Cal-en′-du-la
cal-en′-dul-a′-cĕ-um
Ca′-ley-i
cal-if-or′-nic-us
Ca-li′-nĕ-a
Cal-iph-ru′-rĭ-a*
Ca-lis-ay′-a
Cal′-la
cal-læ-fol′-ĭ-um
Cal-le′-rĭ-i
Cal-lĭ-*an-as′-sa*
Cal-lĭ-an′-dra
cal-lib-ot′-rў-on
Cal-lic-ar′-pa
Cal-lich′-rŏ-a*
Cal-lic′-om-a
Cal-lic-or′-nĭ-a
Cal-lic-ys′-thus
Cal-lig-lōs′-sa
Cal-lig′-on-um
Cal-lim-or′-pha
cal-li-op-sid′-ĕ-a
Cal-lĭ-op′-sis
Cal-lip-ro′-ra*
Cal-lip-sy′-che*
Cal-lip′-ter-is
Cal-lirh′-ŏ-e
Cal-lis′-tach-ys
Cal-lis-tem′-ma*
Cal-lis-te′-mōn*
Cal-lis′-teph-us
cal-lis-tog-lōs′-sa
Cal-lith-au′-ma
cal-lit′-rich-a
Cal-lit′-ris
Cal-lix′-en-e
cal-lo′-sum
Cal-lu′-na
Cal-ob-ot′-rў-a
Cal-och-i′-lus
Cal-och-or′-tus
cal-oc′-om-a
Cal-od-en′-dron
cal-od-ic′-tў-on*
Cal-od′-rac-on*
cal-og-lōs′-sa
Cal-og′-yn-e
cal-om-el′-an-os
Cal-om-er′-ĭ-a
Cal-on-yc′-tĭ-on
Cal-oph′-ac-a*
Cal-oph′-an-ēs
Cal-oph-yl′-lum
cal-op-lec′-tron
Cal-op-o′-gŏn
cal-op-ter′-um
Cal-os-anth′-ēs
Cal-os-cor′-dum
Cal-os-tem′-ma
Cal-oth′-am-nus
cal-oth′-rix
Cal-o′-tis
Cal-ot′-rop-is
Cal-pic-ar′-pum
Cal-pid′-ĭ-a
Cal′-tha
Cal-um′-ba
cal-u′-ra
Cal-vert′-ĭ-a′-na
cal-ves′-cens
Cal-vŏ-a′-na
Cal-yc-anth-a′-cĕ-æ
Cal-yc-anth′-us
Cal-yc-if-lo′-ræ
cal-yc′-in-a
Cal-yc′-ĭ-um
Cal-yc-oph-yl′-lum
cal-yc-o′-sa
Cal-yc-os-tem′-ma
Cal-yc-ot′-om-e*
cal-yc-ot′-rich-a
cal-yc-ul-a′-ta
Cal-yd-er′-mos
Cal-ym-e′-nĭ-a
Cal-ym′-mod-on
Cal-yp-lec′-tus
Cal-yp′-so
Cal-yp-tran′-thēs
Cal-yp-tra′-rĭ-a
cal-yp-tra′-ta
Cal-yp′-trĭ-on
Cal-yp-troc′-al-yx*
Cal-yp-trog′-yn-e
Cal-yp-tron′-om-a*
Cal-ys-ac′-cĭ-on
Cal-ys-teg′-ĭ-a*
Cal-yth′-rix
cal-yt′-rich-a
Cal-yx′-hy-men′-ĭ-a*
Ca′-mār-a
Cam-ar-id′-ĭ-um
Cam-ar-o′-tis
Cam-as′-sĭ-a
Cam-bes-se-de′-sĭ-a
Cam-bo′-gĭ-a
cam′-bri-ca
Cam-brid-gĕ-a′-num
*Cam-el′-lĭ-a**
Cam-el′-lĭ-æ
cam-el′-lĭ-æ-flo′-rum
cam-el′-lĭ-æ-fol′-ĭ-a
cam-e-lo′-rum*
Cam-er-o′-ni
Cam-er-oo-nĭ-a′-num
Cam-er-to′-ni
Cam′-mar-um
Cam-ŏ-en′-sĭ-a
Cam-ol′-lĕ-i
Cam-pa′-nĕ-a
cam-pa′-nif-lo′-ra
Cam-pa′-nul-a
Cam-pa′-nul-a′-cĕ-æ
cam-pa′-nul-a′-rĭ-a
cam-pa′-nul-a′-ta
cam-pa′-nul-if-lo′-ra
cam-pa′-nul-ŏ-i′-dēs
Cam-pa-num-æ′-a
Camp-bel′-li
Camp-bel′-lĭ-æ
Camp-bel′-lĭ-i
cam-pe-chĭ-a′-num
cam-pes′-tra
Cam′-phor-a
Cam-phor-as′-mæ
cam-phor-a′-tus
Cam-pos′-ĭ-i
Camp-sid′-ĭ-um
Camp-te′-rĭ-a
Camp-to′-dĭ-um
camp-top-et′-al-a
Camp′-top-us
Camp-tos-o′-rus
camp-yl-ac-an′-tha
Camp-yl-an-the′-ra
Camp-yl′-ĭ-a
Camp-yl-ob′-ot-rys
camp-yl-oc-ar′-pum
Camp-yl-oc-en′-tron
camp-yl-og-lōs′-sa
Camp-yl-on-eur′-on
ca′-na
can-ad-en′-sĕ
Can-a′-la
can-a-lic-ul-a′-ta
can-a′-rĭ-en′-sis
Can-a-ri′-na
can-a-ri-nŏ-i′-dēs
Can-a′-rĭ-um
Can-av-a′-lĭ-a
Can′-bĭ-a
Can′-bў-i
can-cel-la′-ta
can-dam-ar′-cen-sis
can-de-la′-brif-or′-mis
Can-de-la′-brum
can′-dens
can′-dic-ans
can′-did-a
can-did-a′-tum
can-did-is′-sim-a
can-did′-ul-um
Can-dol′-lĕ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Can-dol′-lĕ-a′-na
Can-dol′-lĕ-i
Can-el′-la
Can-el-la′-cĕ-æ
can-es′-cens
Can-ic-id′-ĭ-a
can-i′-cul-a′-ris
can-i′-na
Can-i′-næ
Can-is′-trum
Can′-na
can-nab′-in-a
Can-nab-in-a′-cĕ-æ
Can-nab-in′-ĕ-æ
Can′-nab-is
can-nab′-ĭ-um
can-næ-fol′-ĭ-um
can-næ-for′-mĕ
Can-nar′-tĭ-i
Can′-nĕ-æ
Can-no′-ni
Can-sco′-ra
can-tab′-ric-us
Can-ter-bur-ў-a′-na
Can-thar-el′-lus
Can′-thĭ-um
can-ton-ĭ-en′-sis
Can′-tŭ-a
can′-tul-a
ca′-num
ca-pen′-se
Ca′-pĭ-a
cap-il-la′-cĕ-a
cap-il-la′-re
cap-il′-lif-ol′-ĭ-a
Cap-il′-lus-Ven′-er-is
cap-is-tra′-tum
cap-it-el-la′-tum
Cap-no′-dĭ-um
Cap-nor′-chis
Cap-par-id′-ĕ-æ
Cap′-par-is
Cap′-rĕ-a
cap-re-a′-rum
cap-rĕ-ol-a′-ta
Cap-rif-ol-ĭ-a′-cĕ-æ
Cap-rif-ol′-ĭ-um
cap-ri′-na
cap-rĭ-ol-a′-ta
Cap-ro-nĭ-a′-na
Cap-rox′-yl-on*
Cap′-sic-as′-trum
Cap′-sic-um
cap-sul-a′-ris
cap′-ut-gal′-li
Cap′-ut-Med-u′-sæ
Car′-ab-us
Car-ac-al′-la
car-ac′-as-a′-num
car-ac′-as-en′-sis
Car-ag-a′-na
Car-ag-u-a′-ta
Car-al′-lĭ-a
Car-al-lu′-ma
car-am-an′-ic-um
Car-am-bo′-la
Car-an′-das
Car-a′-pa
Car-av-a′-ta
Car-be′-nĭ-a
car-char′-ĭ-as
Car-dam-i′-ne
car-dam-i′-ne-fol′-ĭ-a
Car-dam-i′-nēs
Car-dam-o′-mum
Car-der′-i
Car-dĭ-an′-dra
car-din-a′-lis
car-dĭ-och-læ′-na
car-di-op-et′-al-um
car-di-oph-yl′-lus
car-du-a′-cĕ-a
car-du-if-ol′-ĭ-us
Car-dun-cel′-lus
Car-dun′-cul-us
car-dŭ-ŏ-i′-dēs
Car′-dŭ-us
Ca′-rex
Ca′-rĕy-a
Ca′-rĕy-a′-num
Ca-rib-æ′-um
car-ib-e′-a
Ca′-ri-ca
ca-ric-if-ol′-ĭ-a
ca′-ric-in-um
ca′-ric-is
ca-ric-o′-sus
Car′-ĭ-es
car-ĭ-na′-lis
car-ĭ-na′-tus
car-ĭ-nif′-er-um
car-in′-thĭ-ac-a
Car-ĭ-o′-ni
Car-ĭ-op′-sis
car-ĭp-en′-sis
Car-is′-sa
ca-ris′-sim-a
Car-li-e′-ri
Car-li′-na
Car-lu-dov′-ic-a
Car-mi-chœ′-lĭ-a
Car-mi-chœ′-lĭ-æ
Car-mĭ-o′-li
car′-nĕ-a
car-nĭ-ol′-ic-a
car-no′-sul-a
car-no′-sum
Car-ol-i′-na
Car-ol-i′-næ
Car-ol-i′-nĕ-a
car-ol-i′-nĕ-æ-fol′-ĭ-a
car-ol-i-nen′-sis
car-ol-i-nĭ-a′-na
car-ol-i′-nus
Car-o′-ta
car-path′-ic-a
Car-pen-te′-rĭ-a
car-pi′-nif-ol′-ĭ-a
Car-pi′-nus*
Car-poc-ap′-sa
Car-pod-i′-nus
Car-pod-on′-tos
Car-pol-y′-sa
Car-pop-o′-gŏn
Car-te′-sĭ-a
car-tha-gin-en′-se
Cār′-tham-us
Car-thu-sĭ-a-no′-rum
car-til-a-gin′-ĕ-um
Car-to′-ni
Cart-wright-ĭ-a′-nus
car-ŭ-if-ol′-i-um
Ca′-rum
Ca-rum′-bĭ-um
Car-un-cul-a′-rĭ-a
Car-u′-to
Cār′-vi
Car′-ў-a
Car′-ў-oc-ar
car-ў-oph-yl-læ′-a
car-ў-oph-yl-la′-ta
Car-ў-oph-yl′-lĕ-æ
Car-ў-oph-yl′-lus
Car-ў-op′-ter-is
Car-ў-o′-ta
car-ў-o′-tæ-fol′-ĭ-a
Car-ў-ot-ax′-us
car-ў-o-tid′-ĕ-um
car-ў-o′-tŏ-i′-dēs
Cas-ab-o′-næ
Cas-ca′-rĭ-a
Cas-car-il′-la
Cas-ĕ-a′-rĭ-a
cash-me′-rĭ-a′-na
Cas-im-ir-o′-a
Cas-par′-ĭ-a
Cas-par′-ў-a
cas′-pĭ-a
cas′-pic-a
Cas-san′-dra
Cas-seb-ee′-ra
Cas-sel′-ĭ-a
Cas′-sĭ-a
cas-sĭ-ar-ab′-ic-us
Cas′-sid-a
Cas-si′-ne
Cas-si′-nĭ-a
Cas-si-ni-a′-na
cas-si-nŏ-i′-dēs
Cas′-sĭ-op-e
cas-su′-bic-us
Cas-sum-u′-nar
Cas-sy′-tha
Cas-sy′-thĭ-a
cas′-ta
Cas-tag′-nĕ-i
Cas-tal′-ĭ-a
Cas-tan′-ĕ-a*
Cas-tan-os-per′-mum
Cas-til-le′-ja
Cas-til-lo′-a
Cas′-tra
Cas′-trum
Cas-u-ar-i′-na
Cas-u-ar-i′-nĕ-æ

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in *rŏt′*-ten; ō as in v*o′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in h*ouse*; g, c, and ch, always hard, as, for example, g in *g*ood, c in *c*uscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Cat-ak-id-oz-a′-mĭ-a
Cat-al′-pa
cat-al-pæ-fol′-ĭ-a
Cat-an-anch′-e
Cat-ap′-pa
cat-ar-ac′-tæ
Ca-ta′-rĭ-a
Cat-as-e′-tum
cat-aw-bĭ-en′-sis
Cat′-ech-u
Cat-e-na′-rĭ-a
Cates-bœ′-a
Cates-bœ′-i
Cath′-a
Cath-ar-anth′-us
Cath-ar-i′-næ
cath-ar′-tic-a
Cath-car′-ti
Cath-car′-tĭ-a
Cath-car′-tĭ-i
Cat′-ĕ-ang
Cat′-il-lus
Cat-ob-las′-tus
Cat-op′-sis
cat-op′-ter-on
Cat-ra′-rĭ-a
Catt-ley′-a
Catt-ley-a′-num
cau-cas′-ic-us
cau-da′-tum
cau-dic-ul-a′-tum
cau-dif-or′-mis
caul-es′-cens
cau-lĭ-a-la′-ta
cau-lif-lo′-ra
Cau-loph-yl′-lum
Cau-lo-ra′-pa
cau-lor-rhi′-zus
cav′-a
Cav-an-il-le′-sĭ-i
Cav-en-dish′-ĭ-a
Cav′-en-dish-ĭ-a′-num
Cav-en-dish′-ĭ-i
cav-e′-nĭ-a
cay-en-nen′-sĕ
cĕ-an-o′-thif-ol′-ĭ-a
Cĕ-an-o′-thus
ceb-en-nen′-sis
Ceb-ol-le′-ta
Ce′-cid-om-y′-ĭ-a
Ce′-cid-om-y′-id-æ
Ce′-cid-op′-tēs
Ce-cil′-ĭ-æ
Ce-crop′-ĭ-a
Ced′-re-la
Ced-re′-lĕ-æ
Ced′-ron
Ced-ron-el′-la
Ced′-rus*
Ce-i′-ba
Ce-las-trin′-ĕ-æ
Ce-las′-trus*
ce-la-toc-au′-lis
Ce-lo′-sĭ-a*
Cel′-sĭ-a

Cel-sĭ-a′-na
Cel′-sĭ-i
Cel-tid′-ĕ-æ
cel-tid-if-ol′-ĭ-a
Cel′-tis
Cem′-bra
cen-chrŏ-i′-dēs
cen-i′-sĭ-a
Cen-tau′-rĕ-a
Cen-tau′-rĭ-um
cen-tau-rŏ-i′-dēs
Cen′-ter-æ
cen-tet-e′-rĭ-us
cen-tif-ol′-ĭ-a
Cen-tif-ol′-ĭ-æ
Cen-toth-e′-ca
Cen-trad-e′-nĭ-a
Cen-tran-the′-ra
cen-tran′-thif-ol′-ĭ-us
Cen-tran′-thus
Cen-troc-ar′-pha
Cen-tro′-nĭ-a
Cen-trop-et′-a-lum
Cen-trop-o′-gŏn
Cen-tros-ol-e′-nĭ-a
Cen-tros-te′-ma
Ce-o′-dēs
Ce′-pa
ce-pæ-vo′-rum
ce-pa′-rum
Ceph-a-e′-lis
Ceph-al-an-the′-ra*
Ceph-al-anth′-us
Ceph-al-a′-rĭ-a
Ceph-al-i′-na
Ceph-al-on′-ĕ-on
ceph-al-o′-nic-a
Ceph-al-ot-ax′-us
ceph-al-o′-tēs
Ceph-al-o′-tus
ce′-pul-æ
ce-ræ-flo′-ra
ce-ram-en′-sis
Cer-an-the′-ra
Cer-as-ei′-dos
cer′-as-i
cer-as-if′-er-a
cer-as-if-or′-mis
cer-as-tĭ-ŏ-i′-dēs
Cer-as′-tĭ-um
Cer′-as-us
Cer-at′-ĭ-ol-a*
Cer-at-oc-au′-la
cer-at-oc-au′-lis
Cer-at-oc-eph′-al-us
Cer-at-och-i′-lus
Cer-at-od-ac′-tyl-is*
Cer-at-og′-yn-um
Cer-at-ol′-ob-us
Cer-at-on′-ĕ-on
Cer-at-o′-nĭ-a
Cer-at-op-et′-al-um
cer-at-oph-yl′-la
Cer-at-op′-ter-is
Cer-at-os-te′-ma

Cer-at-os-tig′-ma
Cer-at-oz-a′-mĭ-a
Cer′-ber-a
Cer′-cis
Cer-coc-ar′-pus
Cer-cos′-por-a*
ce′-ref-ol′-ĭ-um
ce-rĕ-if-or′-mis
Ce′-rĕ-us*
ce-rif′-er-a
ce′-rin-a
Ce-rin′-the
ce-rin-thŏ-i′-dēs
Cer-is′-cus
cer′-nŭ-a
Ce-rop-e′-gĭ-a
Ce-rop-las′-tēs
Ce-rox′-yl-on
Cer′-ris
Cer-van-te′-sĭ-i
Cer-vi-ca′-rĭ-a
cer-vi-ca-rŏ-i′-dēs
Cer-vic-i′-na
cer-vi′-na
cer′-vus
Ces-ped-e′-sĭ-a
ces-trŏ-i′-dēs
Ces′-trum
Ce′-ter-ach
Ce-to′-nĭ-a
Ceu-torh-yn′-chus
cey-lan′-ic-um
Chab-rĕ-e′-rĭ-i
Chad-a′-ra
Chæ-nes′-tēs
Chæ-nes′-thēs
Chæ-nos′-tom-a
Chæ-roc-am′-pa
chæ-roph-yl′-lŏ-i′-dēs
Chæ-roph-yl′-lum
Chæ-tan-the′-ra
Chæ-toc′-al-yx
Chæ-toch-i′-lus
Chæ-tog-as′-tra
Chæ-tom′-ĭ-um
Chæ-tos′-por-a
Chail-lu-a′-num
Cha-ix′-ĭ-a
Cha-ix′-ĭ-i
Chak-ĭ-at-el′-la
Chal′-cas
chal-ce-don′-ic-um
chal-cog′-raph-us
cha-lep-en′-sis
Cham-æ-bat′-ĭ-a*
Cham-æ-bat′-ĭ-a′-rĭ-a
Cham-æ-bux′-us
Cham-æ-cer′-as-us
Cham-æ-cis′-tus
Cham-æ-cyp′-ar-is
Cham-æ-cyp-ar-is′-sus
Cham-æ-do′-rĕ-a
Cham-æ-do′-rĕ-æ
cham-æ-drif-ol′-ĭ-a
cham-æ-dry̆-ŏ-i′-dēs

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; y̆ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in h*ouse*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Cham-æ′-drў-on
Cham-æ′-drys
Cham-æ-i′-ris
Cham-æ-jas′-me
Cham-æ-lau-cĭ-a′-cĕ-æ
Cham-æ-lau′-cĭ-ŏ-æ
Cham-æ-lau′-cĭ-um
Cham-æ-le′-don
Cham-æ-mes′-pil-us
Cham-æ-mo′-rus
Cham-æ-peu′-ce
Cham-æ′-pit-ys
Cham-ær-anth′-em-um
Cham-æ′-rhod-os
Cham-æ′-rōps
Cham-æ-steph-an′-ĭ-um
Cham-ber-lay′-nĭ-i
Cham-is-so′-a
Cham-is-so′-i
Cham-is-so′-nis
Cham-la′-gu
Cham-om-il′-la
Cham-pa′-ca
Cham-pĕ-o′-ni
Chand′-ler-i
Chan-te′-rĭ-æ
Chan-tĭ′-nĭ-i
Chan-trĕ-e′-ri
Chap-ro′-nĭ-i
Chap-tal′-ĭ-a
Char-ac′-ĭ-as
Char-an′-tĭ-a
Char′-ĭ-eis
Charl-wood′-ĭ-a
Char-me′-lĭ-i
Chas′-can-um
Chas-man′-thĭ-um
chat-ham′-ic-a
Chau-vĕ-e′-ri
Chav-i′-ca
Chay-o′-ta
Che′-bul-a
Cheil-anth′-ēs*
cheil-anth′-um
Cheil-op-lec′-ton
Cheil-os-an′-dra
Cheim-at-ob′-ĭ-a
cheir-anth-if-ol′-ĭ-a
Cheir-anth′-us*
Cheĭ′-ri
cheir-if-ol′-ĭ-um
Cheir-og-lōs′-sa*
cheir-oph′-or-um
Cheir-os-te′-mōn
Cheir-os′-tyl-is
Che′-ken
Chel-i-don′-ĭ-i
chel-i-don′-ĭ-ŏ-i′-dēs
Chel-i-don′-ĭ-um*
Chel-o′-nan-the′-ra
Chel-o′-ne*
Chel-o′-nĕ-æ
chel-o-nĭ-ŏ-i′-dēs
chel-so′-ni
Che-nop-od′-ĭ-a′-cĕ-æ
Che-nop-od′-ĭ-um*
Cher-e′-re
Cher-im-o′-lĭ-a
Cher′-mes
ches-hunt-en′-sis
Ches-ter-to′-nĭ-i
Chev-al-lĭ-e′-ra
Chĭ′-a
Chĭ-az′-os-per′-mum
Chi′-ca
Chĭ′-gua
chi-hu-ah-u-a′-na
chil-en′-se*
Chil-ĭ-an′-dra*
Chil′-ĭ-oph-yl′-lum
Chil-o′-dĭ-a
Chi′-log-nath′-a*
Chi-lop′-od-a
Chi-lop′-sis
Chi-los-tig′-ma
Chim′-æ-ra*
Chi-maph′-il-a*
chim-bor-ac′-en-sis
Chi-mon-anth′-us
chi-nen′-se
Chi-oc-oc′-ca
Chĭ-o-nanth′-us*
Chĭ-o-nas′-pis
chĭ-on-en′-se
Chi-o′-nod-ox′-a
Chi-o-nog′-raph-is
Chir-i′-ta
Chi-rom′-yc-ēs*
Chi-ro′-nĭ-a
Chit-o′-nĭ-a
Chit′-rĭ-a
Chlam-yd′-ĭ-a*
Chlam-yd-os′-tyl-is
Chlam-ys′-por-um
Chlid-anth′-us
Chlŏ-anth′-ēs*
Chlŏ-op′-sis
Chlo′-ra*
chlo-ra′-cĕ-a
chlo-ræ-fol′-ĭ-a
chlo-ranth′-a
Chlo-ranth-a′-cĕ-æ
Chlo′-ris
Chlo-ri′-ta
chlo-roch-i′-lum
Chlo-rog′-al-um
chlo-rŏ-i′-dēs
chlo-rol-eu′-cum
chlo-ron-e′-ma
Chlo-ron-eur′-um
chlo-roph′-rys
Chlo-roph′-yt-um
chlo′-rōps
Chlo-ros′-path-a
chlo-ros-tic′-ta
Chlo-rox′-yl-on
cho-co-en′-sis
Choi-rom′-yc-ēs
Choi′-sў-a
Chois-ў-a′-na
Chom-el′-ĭ-a
Chon-drod-en′-dron
Chon-dro-rhyn′-cha
chon-tal-en′-sis
chord-if-ol′-ĭ-a
Cho-re′-tis
Cho-ris′-por-a
Cho-ris′-tēs
Chor-iz′-em-a
chor-iz′-em-if-ol′-ĭ-a
Chris′-ti
Chris-tĭ-a′-na
Chris-tў-a′-num
chro-mat-el′-la*
chry-sac-anth′-us
Chry-sal-id-oc-ar′-pus
chry-santh′-a
chry-santh′-em-if-ol′-ĭ-a
chry-santh′-em-ŏ-i′-dēs
Chry-santh′-em-um*
chry-santh′-us
chry-sĕ′-i′-dēs
Chry-se′-is
Chry-siph′-ĭ-al-a
Chry-sob-ac′-tron
Chry-sob-al-an′-ĕ-æ
Chry-sob-al′-an-us*
Chry-sob-ot′-rў-a
chry-soc-ar′-pa
Chry-soc′-om-a
Chry-so′-dĭ-um
Chry-sog′-on-um*
chry-sol-eu′-cum
chry-sol′-ob-um
chry-som′-el-as*
Chry-som-el′-id-æ
Chry-so′-pa
chry-sop-et′-al-a
Chry-soph-yl′-lum
chry′-sops
Chry-sop′-sis
chry-sor′-nis
chry-sor′-rhĕ-a
Chry-sos′-cĭ-as
Chry-sos-ple′-nĭ-um
chry-sos′-tach-ys
Chry-sos-tem′-ma
chry-sos-teph′-an-a*
chry-sos′-tom-a
Chry-soth-am′-nus
Chry-soth′-em-is
chry-soth-yr′-sus
chry-so′-tis
chry-sot-ox′-um
chry-sot′-rich-a
Chry-sox′-yl-on
Chry-su′-rus
Chtham-al′-ĭ-a
chu-qui-ten′-sis
Chy-lo′-dĭ-a
Chy-moc-ar′-pus
Chys′-is
Chy-trac-u′-lĭ-a
cib-a′-rĭ-us
cib-o′-rŏ-i′-dēs

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in *rŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Cib-o′-tĭ-um
Cic′-ca
Cic′-er
Cich-or-a′-cĕ-a′-rum
Cich-or′-ĭ-um
Cic-in-de′-la
Cic′-la
Cic-o′-nĭ-um
cic-u-tæ-fol′-ĭ-a
cic-u-ta′-rĭ-a
cic-u-tel′-la
Cid-ar′-ĭ-a
Ci-en-fu-e′-gĭ-a
Ci-en-fu-go′-sĭ-a
Ci-en-kow′-skĭ-a
Cil-ĭ-a′-rĭ-a*
cil-ĭ-a′-ris
cil-ĭ-a′-ta
cil-ĭ-a′-tif-lo′-ra
cil-ic′-ĭ-um
cil-ĭ-ol-a′-ta
cil-ĭ-o′-sa
Cim-ic-if′-ug-a
Cin-cho′-na
Cin-cho-na′-cĕ-æ
Cin-cin-a′-lis
cin-cin-na′-ta
cinc′-tus
Cin-er-a′-rĭ-a
cin-er-a′-rif-ol′-ĭ-um
cin-er′-ĕ-a
cin-nab-ar-i′-na
Cin-nam-od-en′-dron
Cin-nam-o′-mĕ-a
cin-nam-o′-mĕ-us
cin-nam-o′-mif-ol′-ĭ-a
Cin-nam-o′-mum
Ci-o-nid′-ĭ-um
Cip-u′-ra
Cir-cæ′-a
Cir′-ce
cir-cin-a′-tus
cir-cum-scis′-sa
cir-ra′-tum
Cir-rhæ′-a
cir-rha′-ta
cir-rhif′-er-a
Cir-rhop-et′-al-um
cir-rho′-sa
Cir′-sĭ-um
cis-sam-pel-ŏ-i′-dēs
Cis-sam′-pel-os
cis-sif-ol′-ĭ-um
Cis′-sus
Cis-tin′-ĕ-æ
Cis′-tus
Cith-ar-ex′-yl-um
cit-ra′-ta
cit-rif-ol′-ĭ-a
cit-ri′-num
cit-rĭ-od-o′-ra
Cit-ron-el′-la
cit-ros′-mum
Cit-rul′-lus
Cit′-rus

ci-vi′-lis
Clad′-ĭ-us*
Clad-ob′-ĭ-um
Clad-o′-nĭ-a
Clad-os-por′-ĭ-um
Clad-ras′-tis
Clan-bra-sil-ĭ-a′-na
clan-des-ti′-na
clap-ham′-ĭ-i
Clar-ĭ-o′-nĕ-a
cla-ris′-sim-a
Clar′-kĭ-a
Clar′-kĭ-i
Clau-se′-na
cla′-va
cla′-va-Her′-cul-is
cla-va′-tum
Cla-ven′-næ
cla-vic-au′-lis
Cla′-vic-eps
cla-vic-ul-a′-ta
cla-vif-ol′-ĭ-a
Clav-i′-ja
cla′-vip-ēs
Clay′-i
Clay-to′-ni
Clay-to′-nĭ-a
Clay-to′-nĭ-a′-na
Clei-sos′-tom-a
Clei′-stēs
Clei′-trĭ-a
cle′-mat-id′-ĕ-a
Cle′-mat-id′-ĕ-æ
Cle′-mat-is*
Cle-mat-i′-tis
Cle-o′-me
cle-o′-mŏ-i′-dēs
Cle-rod-en′-dron
Cle′-thra
cle-thrŏ-i′-dēs
Cleve-land′-i
Cle-ye′-ra
Clĭ-anth′-us
Cli-de′-mĭ-a
Clif-ford′-ĭ-æ
Clif-to′-nĭ-a
Cli-nop-od′-ĭ-ŏ-i′-dēs
Cli-nop-od′-ĭ-um*
Cli-nos-tyl′-is
Clin-to′-nĭ-a
Cli-tanth′-us
Cli-tor′-ĭ-a
Cli′-vĭ-a
Cli-vĭ-a′-num
Clo-men-oc′-om-a
Clowes′-ĭ-a
Clowes′-ĭ-i
Clu′-sĭ-a
clu′-sĭ-æ-fol′-ĭ-a
Clu-sĭ-a′-na
Clu-sĭ-a′-næ
Clu′-sĭ-i
Cluy′-tĭ-a
clyp-ĕ-a′-ta
Cne-mi′-dĭ-a*

Cnĕ-o′-rum
Cne′-stis
Cne-thoc-am′-pa
Cni′-cus
Cni′-dĭ-um*
cŏ-ad-u-na′-ta
cŏ-arc-ta′-ta
Cob-æ′-a
Co-ba-rĭ-en′-sis
Cob′-bĭ-a′-num
Co-bur′-gĭ-a
Co′-ca
Coc′-cid-æ
coc-cif′-er-a
Coc′-cin-æ
coc-cin′-ĕ-a
Coc-cin-el′-la
Coc-cin-el′-lid-æ
Coc-cin-el-lif′-er-a
Coc-cin′-ĕ-um
Coc-coc-yp′-sel-um
Coc-col′-ob-a
Coc-cot′-or-us
Coc′-cul-us
Coc′-cus
co-chin-chi-nen′-sis
co-chin-el-lif′-er-a
Coch-lĕ-a′-rĭ-a
coch-lĕ-a′-ris
coch-lĕ-a-ris′-path-um
coch-lĕ-a′-ta
Coch-li′-od-a
Coch-lĭ-os-per′-mum
Coch-lĭ-os-te′-ma
co-cŏ-i′-dēs
Co-cŏ-i′-næ
Co′-cos
Co-dĭ-æ′-um
Co-do′-nĭ-um*
co-do-no′-dēs
Co-do-noph′-or-a
Co-do-nop′-sis
cœ-les′-te
Cœ-les-ti′-na
Cœ′-lĭ-a
Cœ-lĭ-op′-sis
cœ-li-ros′-a
Cœ-log-lōs′-sum
Cœ-log′-yn-e
Cœ-los′-tyl-is
cœr-ul′-ĕ-a
cœr-ul-es′-cens
Cof-fe′-a
Co-hu′-ne
Co′-ix
Co′-la
Col′-ax
Col-ber′-tĭ-a
col′-chic-a
Col-chic′-ĕ-æ
col-chic-if-lo′-ra
Col′-chic-um
Col-de′-nĭ-a
Co′-lĕ-a
Cole-broo′-kĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Co′-lĕ-i
Cole-man′-ĭ-i
Col-en′-sŏ-i
col-ĕ-ŏ-i′-dēs
Col-ĕ-on-e′-ma
Col-ĕ-oph′-or-a
Col-ĕ-op′-ter-a
Col-ĕ-os-por′-ĭ- m
Col-er-o′-a
Col′-ĕ-us*
Col-la′-nĭ-a
Col-le′-tĭ-a
Col-ley′-i
Col-lin′-sĭ-a
Col-lin-so′-nĭ-a
col-li′-nus
Col-lod-o′-nĭ-a
Col-lo′-mĭ-a
Col-lyb′-ĭ-a
Col-oc-a′-sĭ-a
col-oc-a′-sĭ-æ-fol′-ĭ-a
Col-oc-yn′-this
Col-og-an′-ĭ-a
col-o′-num
col-o′-rans
col-o-ra′-ta
col-os′-sus
col-po′-dēs
Colqu-houn′-ĭ-a*
Col-ub-ri′-na
Col-um′-ba
Col-um-ba′-rĭ-a
Col-um-ba′-rĭ-æ
col-umb-ĭ-a′-num
Col-um-el′-la
col-um-el-la′-ris
Col-um-el′-lĭ-a
Col-um-el-lĭ-a′-cĕ-æ
Col-um′-næ
col-um-na′-re
Col-um′-nĕ-a
Col-u′-rĭ-a
Col-ur′-na
Col-u′-tĕ-a
Col′-vil-le′-i
Co-ly′-sis
Com′-ă-au′-rĕ-a
Com-ac-li′-nĭ-um
com′-ans
Com-ar-op′-sis
Com-ar-os-taph′-yl-is
Com′-ar-um
Com-a-tog-lōs′-sum
com-a′-tus
Com-bre-ta′-cĕ-æ
Com-bre′-tum
Com-e-sper′-ma
Com-mel-i′-na
Com-mel-i-na′-cĕ′-æ
Com-mel-y′-ni
Com-mer-so′-ni
Com-mer-son′-ĭ-a
Com-mer-so′-nĭ-a′-na
Com-mer-so′-nĭ-i
Com-mĭ-anth′-us
com-mu′-nis
com-mu-ta′-tum
Com-oc-lad′-ĭ-a
com-o′-sa
com-pac′-ta
Com-par-et′-tĕ-a
com-pla-na′-tus
com-plex′-a
com-plic-a′-ta
Com-pos′-it-æ
com-pos′-it-um
com-pres′-sum
Comp-san′-thus
Comp′-sŏ-a
comp′-ta
Comp-to′-nĭ-a
Comp-to-nĭ-a′-na
Co-nan′-dron*
Co-nan′-the-ra
con-cav-æ-fol′-ĭ-a
con′-cav-um
conch-æ-fol′-ĭ-a
conch-if′-er-um
conch-if-lo′-ra
conch-if-ol′-ĭ-a
conch-if-or′-mis
Con′-chĭ-um
con-cin′-na
con′-col-or
con-cor′-dĭ-a
Con-dam-i′-nĕ-a
con-den-sa′-tus
con-fer′-ta
con-fer-tif-lo′-ra
con-fer′-væ
con′-flŭ-ens
con-for′-me
con-fu′-sa
con-ges′-ta
con-glom-er-a′-ta
co′-nic-um
Co-nif′-er-æ
co-nif-er-a′-ta
co-nĭ-if-ol′-ĭ-um
Co-ni′-um*
con-jug-a′-tum
Con-nar-a′-cĕ-æ
Con′-nar-us
Co-noc-ar′-pus
Co-noc-eph-al′-ĭ-æ
Co-noc-lī′-nĭ-um
co-nŏ-i′-dĕ-us
Co-noph-ar-yn′-gĭ-a
co-nōp′-sĕ-a
Co-nos-per′-mum
Co-nos′-tach-ys
Co-nos-teg′-ĭ-a
Co-nos-teph′-ĭ-um
Co-not-rach-e′-lus
Co-not-rich′-ĭ-a
Con-rad -ĭ-a
Con-rad′-ĭ-i
Con-sid-er-an′-ti
con-so-bri′-na
con-sol′-id-a
con-spic′-ŭ-a
con-stric′-tum
con-ta-min-a′-ta
con-tig′-ŭ-um
con-tor′-ta
con-trac′-ta
con-tra-*yer′-ba*
Con-val-la′-rĭ-a
con-val-la′-rĭ-ŏ-i′-dēs
Con-vol-vul-a′-cĕ-æ
con-vol-vul-a′-cĕ-um
Con-vol′-vul-us
Con-y′-za
con-y-zŏ-i′-dēs
Coo′-kĭ-a
Coo-kĭ-a′-num
Coo′-kĭ-i
Coo-ling′-ĭ-i
Coo′-per-i
Coo-per′-ĭ-a
Coo-per-ĭ-a′-num
Cop-ai′-fer-a
co-pal-li′-na
Cop-er-nic′-ĭ-a
Cop-ri′-nus
Cop′-ris
Cop-ros′-ma
Cop′-tis
Cor-ad-i′-nĕ-i
cor-al-lif-lo′-rum
cor-al′-lin-a
cor-al′-lip-ēs
Cor-al-lod-en′-dron
co-ran′-ic-a
Cor-bar-ĭ-en′-sis
Cor-bul-a′-rĭ-a
Cor′-chor-us
Cor-co′-va-den′-sis
cor-da′-ta
Cor-der-oy′-i
Cor′-dĭ-a
Cor-dĭ-a′-cĕ-æ
cor-dif-lo′-ra
cor-dif-ol′-ĭ-us
cor-dig′-er-a
Cor-do-ben′-sis
Cor′-dyc-eps
Cor-dyl-i′-ne
cor-dyl-i′-nŏ-i′-dēs
Cor-e′-ma
Cor-e-op′-sis
Cor-e-thros′-tyl-is
Cor-go′-nen-sis
cor-ĭ-a′-cĕ-um
Cor-ĭ-an′-drum
Cor-ĭ-a′-rĭ-a
Cor-ĭ-a′-rĭ-ĕ-æ
cor-id-if-ol′-ĭ-um
Cor-id′-ĭ-on
cor-ĭ-if-ol′-ĭ-a
cor-ĭ-oph-yl′-la
Cor′-is
Cor-na′-cĕ-æ
Cor-ney-a′-na
cor-nic-ul-a′-tus

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

cor-nif-ol′-ĭ-um
cor-nig-er′-um
Cor-ning-ĭ-a′-na
Cor-ning′-ĭ-i
cor-nu-bĭ-en′-se
Cor-nu-co′-pĭ-æ
Cor′-nus
Cor-nu′-*ti*
Cor-nu′-tĭ-a
cor-nu′-tum
Cor-o′-*kĭ-a*
Cor-ol′-lif-lo′-ræ
cor-om-an-del-ĭ-a′-na
cor-o′-nans
cor-o-na′-rĭ-a
cor-o-na′-ta
Cor-o-nil′-la
cor-o-nil-læ-fol′-ĭ-a
cor-o-nil-lŏ-i′-dēs
cor-o′-nop-if-ol′-ĭ-a
Cor-o′-nop-us
Cor-re′-*a*
cor-re′-æ-fol′-ĭ-a
cor-ru-ga′-ta
cor-sic-a′-na
cor′-sic-um
cor-tic-ic′-ol-or
cor-tic-o′-sum
Cor-ti-na′-rĭ-us
Cor-tu′-*sa*
cor-tu′-*sæ*-fol′-ĭ-a
cor-tu-sŏ-i′-dēs
cor-us′-ca
cor-us′-cans
cor′-vi
Cor-ў-anth′-ēs
Cor-yd′-al-is
Cor-yl-a′-cĕ-æ
cor-yl-if-ol′-ĭ-a
Cor-yl-op′-sis
Cor′-yl-us
cor-ymb-if′-er-um
cor-ymb-if-lo′-ra
cor-ymb-o′-sum
Cor-yn-e′-um
Cor-yn-oc-ar′-pus*
cor-yn-o′-dēs
Cor-yn-oph-al′-lus
Cor-yn-os′-ty-lēs
Cor′-yph-a
Cor-ys-an-the′-ra
Cor-ys-an′-thēs
Cos-cin′-ĭ-um
Cos-man′-thus
Cos-me′-lĭ-a
Cos-mi-bu-e′-*na*
Cos-mid′-ĭ-um
Cos′-mos
Cos-sig′-*nĭ*-a
Cos′-sus
Cos-tæ′-a
cos-ta-ri-ca′-na
cos-ta-ri-cen′-se
cos-ta′-ta
Cos′-tus
cot-in-if-ol′-ĭ-um
Cot′-in-us
Cot-o′-nĕ-as′-ter
Cot-ty-a′-na
Cot′-ul-a
Cot-yl-e′-don
Cou-blan′-*dĭ*-a
Coul′-*ter*-i
Coul-ter′-ĭ-a
Coul-ter-ĭ-a′-na
Co′-*um*
Cour′-*bar-il*
Cour-cel′-*li*
Cour′-*ger-o*
Cou-rou-pi′-*ta*
Cour-se′-*tĭ*-a
Cour′-*tĭ*-i
Cou-si′-*nĭ*-a
Cou-ta′-*rĕ-a*
Cou-tou′-*bĕ-a*
Cow′-*a*
Cow-an′-ĭ-a
Cra′-bro
Crac′-ca
cra-co′-*vĭ*-a
Cram′-be
Cras-ped-a′-rĭ-a*
Cras-ped′-ĭ-a
Cras-ped-ol′-ep-is
cras-sic-au-da′-ta
cras-sic-au′-lis
cras-sif-ol′-ĭ-um
Crass-i′-na
cras-sin-er′-vĭ-um
cras-sin-o′-de
cras′-sip-ēs
Cras′-sul-a
Cras-sul-a′-cĕ-æ
crat-æg-if-ol′-ĭ-a
crat-æg′-in-a
crat-æ*g*-ŏ-i′-dēs
Crat-æ′-gus
Crat-æ′-va
Cra-te-rel′-lus
cra-te-rŏ-i′-dēs
Craw-fur′-*dĭ*-a
Cree-a′-na
cre-na′-ta
cre-na-tif-lo′-rum
cre-na-tif-ol′-ĭ-um
cre-nu-la′-ta
Cre-pid-a′-rĭ-a
cre-pid-a′-tum
Cre-pid-ĭ-um
Cre′-pis*
crep′-it-ans
Cres-cent′-*ĭ*-a
Cres-cent-ĭ-a′-cĕ-æ
cre-ta′-cĕ-um
cre-ten′-sis
cre′-tic-us
cri-nif′-er-a*
cri-nif-lo′-rum
cri-ni′-ta
Crin-od-en′-dron*
Crin-o′-nĭ-a
Crin′-um
Cri-oc′-er-is
cris′-pa
cris-pa′-tum
cris-pil-ab′-ĭ-a
cris′-pul-um
Cris′-tă-gal′-li
Cris-ta′-rĭ-a
cris-ta′-ta
cris-ta-tel′-lum
crith-mif-ol′-ĭ-a
Crith′-mum
croc-a′-ta
croc′-ĕ-us
croc-id-ip′-ter-um
croc-if-ol′-ĭ-us
Croc-os′-mĭ-a
Croc-os-mif-lo′-ra
Croc′-us*
Crœ′-sĭ-a
Crœ′-sus
Croo′-*mĭ*-a
Cros-san′-dra
Cross′-ĭ-i
Crot-al-a′-rĭ-a
Crot′-ōn*
Crou′-*cher*-i
Crow′-*ĕ*-a
Crow-ĕ-a′-na
Cruc-ĭ-an-el′-la*
cruc-ĭ-a′-tum
Cruc-if′-er-æ
Cruc-if′-er-a′-rĭ-um
cruc′-is
crŭ-en′-ta
Cruik-shank′-ĭ-a
Cruik-shank′-ĭ-i
Crus-gal′-li
Crus-ta′-cĕ-a
Crux-And′-re-æ
Cryp-tan′-thus
Cryp-toc-am′-pus
Cryp-toch-i′-lus
cryp-toc′-op-is*
Cryp-toc-or′-yn-e
Cryp-tog-am′-ĭ-a
Cryp-tog-ram′-me
Cryp-tol′-ob-us
Cryp-tom-er′-ĭ-a
Cryp-toph-rag′-mĭ-a
Cryp-tos-ac′-cus
Cryp-tos-o′-rus
Cryp-tos′-tach-ys
Cryp-tos-teg′-ĭ-a
Cryp-tos-tem′-ma
Cryp-tos′-tyl-is
crys-tal′-lin-um
Cub-æ′-a
Cu-be′-*ba*
cub-en′-se
cuc-u′-li
cuc-ul-′a′-rĭ-a
cuc-ul-la′-tum
cuc-um-er-if-ol′-ĭ-us

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ai*n; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Cuc′-um-is
Cuc-ur′-bit-a
Cuc-ur-bit-a′-cĕ-æ
Cuc-ur-bit-a′-rĭ-a
cuc-ur-bit-i′-na
Cud-ra′-nĭ-a
Cu-je′-te
Cul-ca′-sĭ-a
Cul′-cit-a
Cul-il-aw′-an
cul-tra′-ta
cul-trif-ol′-ĭ-um
cul-trif-or′-mis
Cum-ing′-i-a
Cum-ing-ĭ-a′-na
Cum-ing′-ĭ-i
Cum-ming′-ĭ-i
Cun′-cĕ-a
cun-di′-nam-ar-cen′-sis
Cun-du-ran′-go
cun-ĕ-a′-tus
cun-ĕ-if-ol′-ĭ-um
cun-ĕ-if-or′-mis
Cun-i′-la
Cu-ni′-na
Cun-ning-ham′-ĭ-a
Cun-ning-ham-ĭ-a′-na
Cun-ning-ham′-ĭ-i
Cu-no′-nĭ-a
Cu-no′-nĭ-ĕ-æ
Cu-pa′-ni
Cu-pa′-nĭ-a
Cu-pa-nĭ-a′-nus
Cu′-phĕ-a
Cu′-pĭ-a
cup′-rĕ-a
cup-rĕ-a′-ta
cup-res-pin-na′-ta
Cup-res-sin′-ĕ-æ
cup-res′-sin-um
cup-res-sŏ-i′-dēs
Cup-res′-sus
Cu-pul-if′-er-æ
cu-ras-sav′-ic-um
Cu-ra-tel′-la
Cur-cul′-ig-o
cur-cul′-ig-ŏ-i′-dēs
Cur-cul′-ĭ-o
Cur-cul-ĭ-o′-nid-æ
Cur′-cum-a
Cur-mer′-ĭ-a
Cur-now-ĭ-a′-na
Cur-ro′-ri
Cur-tis′-ĭ-a
Cur-tis′-ĭ-i
cur′-tum
cur-va′-tor
cur-va′-tum
cur-vid-en-ta′-tum
cur-vif-lo′-rus
cur-vif-ol′-ĭ-um
*Cus-cu′-ta**
Cus-cu-ta′-cĕ-æ
cus-cu-tæ-form′-is
Cus-pid-a′-rĭ-a
cus-pid-a′-ta
Cus-so′-nĭ-a
cu-tis-pon′-gĭ-a
Cy̆′-am-us*
Cy̆-an-anth′-us
cy-an′-ĕ-a
Cy-an-el′-la
cy̆-an-oc-ar′-pus
cy̆-an-oc-oc′-ca
Cy̆-an-oph-yl′-lum
cy̆-an-os-per′-ma
Cy̆-an-o′-tis
Cy̆-an′-us*
Cy̆-ath′-ĕ-a*
cy̆-ath-ĕ-æ-fol′-ĭ-um
cy̆-ath-ĕ-ŏ-i′-dēs
Cy̆-ath-o′-dēs
Cy-ath-oph′-or-a
Cyb′-el-e
Cy-bel′-ĭ-on
Cyb′-is-ter
Cyc-ad-a′-cĕ-æ
cyc-ad-ŏ-i′-dēs
Cy′-cas
Cy′-clam-en*
Cy-clan′-dra
Cy-clob-oth′-ra
Cy-clo′-dĭ-um
Cy-clog′-yn-e
Cy-clon-e′-ma
Cy-clop-el′-tis
Cy-clo′-pĭ-a
Cy-clop-o′-gŏn
Cy-clos-te′-mŏn
Cyc-no′-chēs
Cyd-o′-nĭ-a
cyd-o′-nĭ-æ-fol′-ĭ-a
Cyl-ic-ad-e′-nĭ-a
cyl-in-dra′-cĕ-a
cyl-in′-dric-um
cyl-in′-drus
Cyl-is′-ta
Cy-mat′-ĭ-on
Cym-bal-a′-rĭ-a
Cym-bid′-ĭ-um
cym-bif-or′-mis
Cym-bu′-rus
cy-mo′-sa
cyn-anch′-ic-a*
cyn-anch-if-ol′-ĭ-a
cyn-anch-ŏ-i′-dēs
Cyn-anch′-um
Cyn′-ar-a
cyn-ar-ŏ-i′-dēs
Cyn-ip′-id-æ
Cyn′-ips
Cyn-oc-ram′-be
Cyn-oc′-ton-um*
Cyn′-od-on
Cyn-og-lōs′-sum
Cyn-om-e′-tra
cyn-oph-al-loph′-or-a
Cyn-os′-bat-i
Cyp-ar-is′-sĭ-as
Cyp-el′-la
Cyp-e-ra′-cĕ-æ
Cyp-e′-rus*
Cy′-phĭ-a*
Cy-phok-en′-fĭ-a
Cy-phom-an′-dra
Cy-phos-per′-ma
Cyp′-ri
Cyp-rip-ed′-ĭ-ĕ-æ
Cyp-rip-ed′-ĭ-um*
cyp′-rĭ-us
Cy-ril′-la
Cy-ril′-lĕ-æ
Cyr′-ta
Cyr-tan-dra′-cĕ-æ
Cyr-tan-the′-ra
Cyr-tan-thif-lo′-rum
Cyr-tan′-thus
Cyr-toc′-er-as
Cyr-toch-i′-lum
Cyr-tod-ei′-ra
Cyr-tom-iph-leb′-ĭ-um
Cyr-tom′-ĭ-um
Cyr-top-e′-ra
Cyr-toph-yl′-lum
Cyr-top-od′-ĭ-um
Cyr-tos′-tach-ys
Cys-tac-anth′-us
Cys-tan′-the
Cys-tid-ĭ-anth′-us
Cys-top′-ter-is
Cys′-top-us
cyt-is-ŏ-i′-dēs
Cyt′-is-us
Cyt-oph-yl′-lum
Czac′-kĭ-a

Dab-œ′-cĭ-a
dac-ryd-ĭ-ŏ-i′-dēs
Dac-ryd′-ĭ-um
Dac′-tyl-ic-ap′-no-*
dac′-tyl-if′-er-a
dac′-tyl-if-ol′-ĭ-um
Dac′-tyl-is
Dac′-tyl-oc-ten′-ĭ-um
dac-tyl-ŏ-i′-dēs
dac′-tyl-on
Dac-tyl-op′-ĭ-us
dac-tyl-op′-ter-um
Dac-tyl-os′-tyl-ēs
dæ-dal′-ĕ-a
Dœ′-mĭ-a
Dæ-mo′-nor-ōps
dag-u-en′-se
*Dah′-lĭ-a**
Da′-hoon
da-hu′-ric-a
Dă′-is
Dal-ber′-gĭ-a
dal-ber-gĭ-ŏ-i′-dēs
*Da′-lè-a**
dal-ec-ar′-lic-a
Dal-ech-am′-pĭ-a
Dal-ech-am′-pĭ-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; y̆ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pa*i*n; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Dal-gairn′-shĭ-æ
Dal-hou′-shĭ-æ
Dal-ib-ăr′-da
Dal-mai-shĭ-a′-na
dal-mat′-ic-a
Dal-rymp′-lĕ-a
dam-as-ce′-na
Dam-as-o′-nĭ-um
Dam′-mar-a
Dam-nac-anth′-us
Dam-pĭ-e′-ra
Dam-pĭ-e′-ri
*Da′-nă-a**
Dan′-a-e
Da′-næ-a
Dan-ĕ-el′-ĭ-i
Daph′-ne
daph-ni′-tēs
daph-nŏ-i′-dēs
Da′-rĕ-a
Dar-ling-to′-nĭ-a
Dar′-win-i
Dar-win′-ĭ-a
Dar-win′-ĭ-i
das-ỹ-anth′-a
das-yc-ar′-pum
das-yc-eph′-al-um
Das-ych-i′-ra
das-yg-lōt′-tis
das-yl-i′-rĭ-ŏ-i′-dēs
Das-yl-i′-rĭ-on
das-yph-yl′-la
das-yp-o′-gŏn
das-ys-per′-ma
das-ys′-tyl-a
Dat-is′-ca
Dat-is′-cĕ-æ
Dat-u′-ra
Dau-ben-to′-nĭ-a
Dau-be′-nỹ-a
dau-cel′-la
dau-cif-ol′-ĭ-um
Dau′-cus
dau′-ric-a
Daut-wit′-zĭ-i
Dav-al′-lĭ-a
Dav-al-lĭ-a′-na
dav-al-lĭ-ŏ-i′-dēs
Dav-ĕ-au-a′-na
Dav-ĕ-au-ĭ-a′-na
Da-vid-ĭ-a′-na
Da-vid-so′-ni
Da-vid-so′-nĭ-a
Da-vie′-shĭ-a
Da-vis′-ĭ-i
da-vu′-ric-um
Da′-vỹ-a
Daw-so′-ni
Daw-so-nĭ-a′-na
Day-a′-na
dĕ-al-ba′-ta
de Bar-y-a′-num
de′-bil-e
Dec-ab-el′-on-e*
Dec-aisn′-ĕ-a
Dec-aisn-ĕ-a′-na
Dec-aisn′-ĕ-i
Dec-an-doll′-ĭ-i
dec-an′-dra
dec-ap-et′-al-a
Dec-as-per′-mum
Dec-as′-po-ra
dec-em-li-nĕ-a′-ta
dec-id′-ŭ-a
de-cip′-ĭ-ens
Deck-er′-ĭ-a
Deck-er-ĭ-a′-num
de-cli-na′-tum
de-col-o′-rans
de-com-pos′-it-a
dec-o′-ra
dec′-or-ans
Dec-os-ter-ĭ-a′-na
dec-um-a′-na
Dec-um-a′-rĭ-a
de-cum′-bens
de-cur′-rens
de-cur-si′-va
dec-us-sa′-ta*
de-fic′-ĭ-ens
de-fix′-um
de-flex′-a
de-fol-ĭ-a′-rĭ-a
de-for′-mans
de-for′-mis
De-her-ain′-ĭ-a
Deil-iph′-il-a
Del-ab-e′-chĕ-a
Del-ar′-brĕ-a
Del-au-a′-na
de-lec′-ta
de-lic-a′-ta
de-lic-a-tis′-sim-a
de-lic-ĭ-o′-sa
De-li′-ma
De-los′-tom-a
del-phi-nen′-sis
del-phi-nif-ol′-ĭ-um
Del-phi′-nĭ-um*
del-tog-lōs′-sum
del-toid′-ĕ-a
Del-to-i′-dēs
Dem-id-o′-vĭ-a
de-mis′-sum
De-moc-rit-e′-a
den-dri′-tic-um
Den′-drĭ-um
Den-drob′-ĭ-um
Den-droch-i′-lum
Den-droc-ol′-la
den-drŏ-i′-dĕ-um
Den-drol-ob′-ĭ-um
Den-drom-e′-con*
Den-drop′-an-ax
Den-dros′-er-is
Den-is-o-nĭ-a′-num
Den-is-o′-nĭ-i
Den-nis-o′-nĭ-i
Denn-stæd′-tĭ-a
den′-sa
den-sa′-ta
dens′-can-is
den-sif-lo′-rum
Den-ta′-rĭ-a
den-ta′-ta
den-tic-ul-a′-tum
Den-tid′-ĭ-a
den-to′-sus
de-nu-da′-ta
De-od-a′-ra
Dep-ar′-ĭ-a
de-pau′-per-ans
de-pau-per-a′-ta
de-pen′-dens
Dep′-pĕ-a
Dep-pe-a′-na
Dep′-pĕ-i
de-pres′-sa
De-pres-sa′-rĭ-a
de-pres-sel′-la
Der-map′-ter-a
Der-mat-oph′-or-a
Der-wen′-tĭ-a
Des-cant-a′-rĭ-a
Des-champ-shĭ-a′-na
de-scis′-cens
Des-er′-ti
Des-fon-tai′-nĕ-a
Des-manth′-us
Des-met-ĭ-a′-na
Des-moch-æ′-ta
Des-mo′-dĭ-um
des-mon-cŏ-i′-dēs
Des-mon′-cus
de-struc′-tor
dĕ-us′-tus
Deut′-zĭ-a
Dev-an-say-a′-na
de-vas-ta′-trix
Dev-e-au-a′-na
Dev-o′-nĭ-a′-num
Dev-o′-nĭ-en′-sis
Dev-o-shĭ-a′-na
Dĭ-ac-al′-pe
di-ac-an′-tha
Di-ac′-rĭ-um
dĭ-ad-e′-ma
dĭ-ad-e-ma′-tus
Dĭ-a′-næ
dĭ-an′-dra
Dĭ-a-nel′-la
Dĭ-an-the′-ra
dĭ-anth-ŏ-i′-dĕ-a
di-anth-ŏ-i′-dēs
Dĭ-anth′-us
Dĭ-ap-en′-shĭ-a
Dĭ-ap-en-shĭ-a′-cĕ-æ
dĭ-ap-en-sŏ-i′-dēs
dĭ-aph′-an-um
Dĭ-aph′-or-a
Dĭ-aph-or-anth′-em-a
Dĭ-as′-cĭ-a
Dĭ-as′-ĭ-a
Dĭ-as-pi′-næ
Dĭ-as′-pis

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in pā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ỹ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Dĭ-as-tel′-la
Dĭ-as-te-man′-the
Dĭ-as′-troph-us
Dib-blem′-ma
Dic-en′-tra
Dic-er′-ma
Dich-æ′-a*
Dich-op′-sis
Dich-o′-ris-an′- ra
Dich-os-e′-ma
Dich-os′-ma
dich-ot′-om-a
dich′-rŏ-a
Dich-ro′-ma
Dich-ros′-tach-ys
Dich-rot′-rich-um
Dick-ie-a′-na
Dick-so′-ni
Dick-so′-nĭ-a
Dic-so-nĭ-a′-na
Dic-lip′-ter-a
Dic-lyt′-ra*
dic-oc′-cum
dic-ra-nan-the′-rum
Dic-ra-nu′-ra
Dic-tam′-nus
Dic-tў-anth′-us
Dic-tym′-ĭ-a
dic-tў-oc-al′-lis
Dic-tў-og-ram′-me*
Dic-tў-op′-ter-is
Dic-tў-op′-ter-yx
Dic-tў-os-per′-ma
Dic-tў-ox-iph′-ĭ-um
Dic-yr′-ta
Did-ĕ-e′-ri
Did-is′-cus
did-is′-tich-a
did′-ym-a
Did-ym-oc-ar′-pus*
Did-ym-och-læ′-na
Did-ym-os-per′-ma
Di-ef-fen-bach′-ĭ-a
Dĭ-el′-lĭ-a
Dĭ-el-yt′-ra*
Dĭ-er-a′-ma
Dĭ-er-vil′-la
Dĭ-et′-ēs
dif-for′-me
dif-fu′-sus
Dig-by-a′-na
Dig-it-a′-lĕ-æ
dig-it-a-lif-lo′-rum
Dig-it-a′-lis*
Dig-it-a′-rĭ-a
dig-it-a′-ta
Dig′-raph-is
Digs-wel-lĭ-a′-na
di-la-ta′-tum
Dil-a′-tris
di-la′-tum
Dil-le′-nĭ-a
Dil-le-nĭ-a′-cĕ-æ
Dil-le′-nĭ-i
Dill-wyn′-ĭ-a

di-mid-ĭ-a′-tum
Dim-oc-ar′-pus
Dim-orph-anth′-us
Dim-orph-oth-e′-ca
dim-orph′-um
Di-ne′-tus
Din-eu′-ra
dĭ-od′-on
dĭ-oi′-ca
Dĭ-o-næ′-a
Di-o′-on
Di-o-po′-gōn
Dĭ-os-cor′-ĕ-a
Dĭ-os-cor-ĕ-a′-cĕ-æ
Dĭ-os-cor′-ĕ-æ
Dĭ-os-cor′-id-is
Dĭ-os′-ma
dĭ-os-mæ-fol′-ĭ-a
dĭ-os-mif-ol′-ĭ-a
dĭ-os-mŏ-i′-dēs
Di-os′-pyr-os*
Dĭ-o′-tis
Dip-ca′-di
dip-et′-al-a
Diph′-ac-a
diph-yl′-la
Diph-yl-lei′-a
Diph-y′-sa*
dip-lac-anth′-a
Dip′-la-cus
Dip-la-de′-nĭ-a
dip-laz-ĭ-ŏ-i′-dēs
Dip-laz′-ĭ-um
Dip-lec′-thrum
Dip-loc′-al-yx
Dip-loch-i′-ta
Dip-loc′-om-a
Dip-lo′-dĭ-um
Dip-log-as′-tra
Dip-loi-æ′-na
Dip-lon-e′-ma
Dip′-lon-yx
Dip-lop-ap′-pus
Dip-loph-yl′-lum
Dip-lo′-sis
Dip-loth-e′-mĭ-um
Dip-od′-ĭ-um
Dip-sac′-ĕ-æ
dip-sac′-ĕ-us
Dip′-sac-us
Dip′-ter-a
Dip-ter-ac-anth′-us
Dip-ter-oc-ar′-pĕ-æ
Dip-ter-oc-ar′-pus
Dip′-ter-yx
dip-yr-e′-na
Dir′-ca
dirh′-od-a
Di′-sa
Dis-an′-dra
Dis-ar′-ren-um*
Dis-ca′-rĭ-a
Dis-chid′-ĭ-a
dis-coi′-da-lis
dis′-col-or

Dis-com-yc-e′-tēs
Dis-el′-ma
Dis-em′-ma
Dis-oc-ac′-tus
Dis-oc-ap′-nos
dis′-par
Dis′-por-um
dis-sec′-tum
dis-sĭm′-il-e
dis-sit-if-lo′-ra
dis-tach′-ў-a
dis-tach′-ў-on
dis′-tans
Dis-teg-anth′-us
dis-tich-anth′-a
dis′-tich-on
dis′-tich-um
dis-til-la-to′-rĭ-a
Dis-trep′-ta
dis′-tyl-a
Dis-tyl′-ĭ-um
Dit′-ul-a
Dĭ-u′-ris
dĭ-ur′-na
Dĭ-u-rog-lōs′-sum
di-va-ric-a′-tus
di-ver′-gens
di-ver-sif-lo′-ra
di-ver-sif-ol′-ĭ-a
di′-ves
di-vi′-sa
dix-anth′-um
Dix-i-a′-na
Do-be′-ra
Dodd′-sĭ-i
do-dec-an′-dra*
Do-dec-ath′-ĕ-on
Dodg-so′-ni
Dodg-so′-nĭ-i
Dod-on-æ′-a
Dod-on-æ′-æ
Dod-on-æ′-i
Do-el-lĭ-a′-num
dol-a′-brif-or′-me
dol-ich-oc-en′-tra*
dol-ich-orh-i′-za
Dol′-ich-os
Dol-ĭ-oc-ar′-pus
Dol-lin-e′-ra
dol-o′-sum
Dom-bey′-a
Dom-bey-a′-num
Dom-bey′-ĕ-æ
dom-es′-tic-a
dom-in-gen′-sis
Dom-in-ĭ-a′-na
Dom-in′-ĭ-i
Dom-in′-ul-a
Dom-in-ў-a′-num
Don′-ax
Donck-el-aar′-ĭ-i
Don′-dĭ-a
Don-dĭ′-sĭ-a
Don-er-ail-en′-sis
Don′-ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Don-ĭ-a′-na
Don′-ĭ-i
Don-ing-ton-en′-sis
Donk-el-aar-ĭ-a′-na
Doo′-dĭ-a
Dor-coc′-er-as
Dor′-cus
Do-re′-ma
Do′-rĭ-a
Dor-man-ĭ-a′-na
*Do-ro-ni′-cum**
Dor-ste′-nĭ-a
Dor-ў-anth′-ēs*
Dor-yc′-nĭ-um
Dor-ў-op′-ter-ĭs
Dor-yph′-or-a
Dos-si′-nĭ-a
Do′-su-a
Doth-id-ĭ-a′-cĕ-æ
Doug-las′-ĭ-a
Doug-las-ĭ-a′-na
Doug-las′-ĭ-i
Dov-as-to′-ni
Dow-ĭ-a′-na
Dow-ing′-ĭ-a
Down-ing′-ĭ-a
Dra′-ba
dra-bif-ol′-ĭ-a
Drac-æ′-a
Drac-æ′-na
Drac-æ-nop′-sis
Drac′-o*
Drac-oc-eph′-al-um
Drac-o′-nis
Drac-on′-tĭ-um
Drac-oph-yl′-lum
Drac-o′-pis
drac-un′-cul-ŏ-i′-dēs
Drac-un′-cul-us
Dra-kæ′-a
Dra-kĕ-a′-na
Dre-gĕ-a′-na
Dre′-gĕ-i
Dre-gĭ-a′-na
Dre′-gĭ-i
Drep-an-oc-ar′-pus*
drep′-an-um
Dri′-lus
Dri′-mĭ-a*
Dri′-mĭ-op′-sis
Dri-moph-yl′-lum
Dri′-mys
Dri′-mys-per′-mum
Dros′-er-a
Dros-er-a′-cĕ-æ
dros-er-ŏ-i′-dēs
Dros-oph-yl′-lum
Dru′-dĕ-i
Drum-mon′-dĭ-a
Drum-mon-dĭ-a′-na
Drum-mon′-dĭ-i
dru-pa′-cĕ-a*
Dru-pa′-cĕ-æ
dru-pa′-rum
dru-pif′-er-a

Dru′-ry-i
drў′-ad-ēs
drў-ad′-ĕ-us
Dry-an′-dra
dry-an-drŏ-i′-dēs
Drў′-as
Dry′-mo-da
Dry-mog-lōs′-sum
Dry-mo′-nĭ-a
Dry-moph-lœ′-us
Dryn-a′-rĭ-a
Drў-ob-al′-an-ōps*
drў-og′-raph-us
Drў-oph-an′-ta
Drў-op′-ter-is
Drў-os-tach′-ў-um
Drў-ot′-er-as
Dry′-pet-ēs
Dry′-pis
dub′-ĭ-a
Du-boi′-sĭ-a
Du-breu-il′-ĭ-a
Du-char′-trĕ-i
Du-chek′-ĭ-a
Du′-chol-a
Duf′-fў-i
Dul-cam-a′-ra
Dul′-cis
Du′-lĭ-a
Du-ma′-sĭ-a
Du-mer-il′-ĭ-a
du-me-to′-rum
Du-mor-ti-e′-ri
du-mo′-sum
Dun′-nĭ-i
Du-per′-ry-a
du-pla′-na
du′-plex
du′-plic-a′-ta
du′-ra
du-rac′-in-a
Du-ran′-ta
Du-ra′-tĭ-i
Du-rim-in′-ĭ-um
Du′-rĭ-o
du-rĭ-us′-cul-a
Du′-tra
Du-val′-ĭ-a
Du-val-ĭ-a′-na
Du-vau′-a
Dyck′-ĭ-a
Dyp′-sis
Dys-o′-da
Dys-o′-dĭ-a
Dys-soch-ro′-ma

Ĕ-ar′-in-a
Earl′-ĭ-a
Earl′-ĭ-i
Eat′-on-i
Eb-en-a′-cĕ-æ
eb-en-a′-cĕ-um
Eb′-en-us

Eb-er-mai′-er-a
e-brac-tĕ-a′-tus
Eb′-ul-us
eb-ur′-nĕ-a
Ec′-æ
Ec-bal′-lĭ-um
Ec-crem-oc-ar′-pus
Ech-ar′-dĭ-a
Ech-ev-e′-rĭ-a
Ech-id′-nĭ-um
Ech-id-nop′-sis
ech-ĭ-if-lo′-ra
Ech-i-na′-cĕ-a
Ech-i-nanth′-us
Ech-i-na′-ta
ech-i-nif-or′-mis
Ech-i′-noc-ac′-tus
ech-i′-noc-ar′-pa
Ech-i′-noc-e′-rĕ-us
Ech-i-noch′-lo-a
Ech-i′-noc-ys′-tis
Ech-i′-nōps
Ech-i-nop′-sis
ech-i-nos-ep′-al-a
Ech-i-nos-per′-mum
Ech-i-nos′-tach-ys
Ech-ĭ-o-glōs′-sum
Ech′-ĭ-ŏ-i′-dēs
Ech-ĭ-op′-sis
Ech-i′-tēs
Ech′-ĭ-um
Eck-hard′-ti
Eck-lon-ĭ-a′-na
Ec′-lop-ēs
e-cor-nu′-tum
e-den′-tul-a
Edge-worth′-ĭ-a
Edge-worth′-ĭ-i
Edg-worth′-ĭ-i
Ed-rai-anth′-us
Ed-u-ar′-di
ed-u′-lĕ
Ed-war′-di
Ed-ward′-sĭ-a
ef-fu′-sus
Eg-en-olf′-ĭ-a
Eg-er-to-nĭ-a′-num
Eg-lan-te′-rĭ-a
Eg-lan-te′-rĭ-æ
Eh-ren-ber-gĭ-a′-na
Eh-re′-tĭ-a
Eh-re′-tĭ-ĕ-æ
Eich-hor′-nĭ-a
Eich-le′-ri
Ek-eb-er′-gĭ-a
El-æ-ag-na′-cĕ-æ
el-æ-ag-nif-ol′-ĭ-us
el-æ-ag-nŏ-i′-dēs
El-æ-ag′-nus
El-æ′-is
El-æ-oc-ar′-pus
El-æ-od-en′-dron
El-aph-og-lōs′-sum
El-aph-rox′-yl-on
el-as′-tic-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

El′-at-e
El-at-e′-rid-æ
El-at-e′-rĭ-um
El-at-ĭ′-nēs*
el-at-ĭ′-num
e-la′-tĭ-or*
e-la′-tum
El-dor-a′-do
E-lec′-tra
e-lec′-tric-us
e′-leg-ans
e-leg-an-tis′-sim-a
El-em-ce-tĭ-a′-na
El-eng′-i
el-eph-an′-tip-ēs
el-eph-an′-tum
El-eph-an-tu′-sĭ-a
El-et-ta′-rĕ-a
El-eu-si′-ne
El-ich-ry′-sum
E-li′-sen-a
El-iz-ab-e′-thæ
El-la-com′-bĕ-i
El-lĕ-anth′-us
El-lem-ee′-ti
El-liot′-tĭ-a
El-liot-tĭ-a′-num
el-lip′-tic-a
El-lis′-ĭ-i
El-lob-oc-ar′-pus
El-o′-dĕ-a
el-o′-dēs
e-long-a′-tus
El-pe′-nōr
El-u-ter′-ĭ-a
el-vas′-ton-en′-sis
El-wang-er-ĭ-a′-na
El-wes′-ĭ-i
El-wor′-thĭ-i
El′-ym-us
e-mar-gin-a′-ta
Em-be′-lĭ-a
Em-both′-rĭ-um
Em-brў-op′-ter-is
E-mer-ic′-ĭ-a
Em-er-so′-ni
E′-mer-us
em-et′-ic-a
e′-min-ens
Em-o′-di
Em-me′-nan-the
Em-pet-ra′-cĕ-æ
em-pet-rif-ol′-ĭ-a
em-pet-rif-or′-mis
Em-pet′-rum
Em′-phyt-us
Em-pleu′-rum
Em-pu′-sa
En-ar′-gĕ-a
en-cel-lĭ-ŏ-i′-dēs
En-ceph-al-ar′-tos
En-cy′-clĭ-a
En′-der-a
En-dĭ′-vĭ-a
End-lich-e-rĭ-a′-na
en-doch′-ar-is
En-dop-i′-sa
En-dre′-sĭ-i
En′-dros-is
en-e-mid-oph′-or-um
En-e′-mĭ-on
En-gel-man′-ni
Enk-ĭ-anth′-us
en-nĕ-aph-yl′-la
e-no′-dis
E-no′-dĭ-um
en′-sa-ta
En-se′-te
en-sif-ol′-ĭ-a
en-sif-or′-mis
En-ta′-da
En-tel-e′-a
en-tom-or-rhi′-za
E-o-me′-cōn
E-o-pep′-ōn
ep-ac-rid′-ĕ-a
Ep-ac-rid′-ĕ-æ
ep-ac′-rĭ-ŏ-i′-dēs
Ep′-ac-ris
Ep-ei′-ra
Eph-ed′-ra
eph-ed-rŏ-i′-dēs
Eph-e′-mer-um
Eph-ip′-pĭ-um
Ep-ic-ar-pu′-rus
Ep-id-en′-drĕ-æ
Ep-id-en-drŏ-i′-dēs
Ep-id-en′-drum
Ep-ig-æ′-a
Ep-ig-yn′-ĭ-um
Ep-il-i′-num
Ep-il-ob′-ĭ-um
Ep-im-e′-dĭ-um
Ep-ip-ac′-tis
Ep-iph′-or-a
ep-ip′-ter-a
Ep-iph-yl′-lum
Ep-ip-rem′-num
Ep-is′-cĭ-a
Ep-is-teph′-ĭ-um
Ep-ith′-ym-um
Ep-rem-ēs′-nil-ĭ-a′-num
eq-ues′-tris
eq-ui′-na
Eq-uis-e-ta′-cĕ-æ
Eq-uis-e′-ti
eq-uis-e′-tif-ol′-ĭ-a
Eq-uis-e-tin′-ĕ-æ
Eq-uis-e′-tum
Er-ag-ro′-stis
E-ran′-them-um
Er-an′-this
Erb-lĭ′-chĭ-a
Er-cil′-la
Er-de′-lĭ-i
er-e-cif-ol′-ĭ-a
e-rec′-ta
Er-em-baul′-ti
Er-e′-mĭ-a*
er-e-mic′-ol-a
er-e-mi′-ta
Er-e-moph′-il-a
Er-e-mos-tach′-ys
Er-e-mu′-rus
Er′-ĭ-a*
er-ĭ-anth′-a
er-ĭ-an-the′-ra
Er-ĭ-anth′-us
Er-i′-ca*
Er-i-ca′-cĕ-æ
er-i′-cæ-fol′-ĭ-a
er-i′-cif-ol′-ĭ-a
Er-i′-cin-el′-la
er-ic′-ŏ-i′-dēs
E-rig′-er-ōn*
E-rin-a′-cĕ-a*
Er-i′-nĕ-um*
er-i′-nŏ-i′-dēs
Er-i-nos′-ma
Er-i′-nus
Er-ĭ-ob-ot′-rў-a
Er-ĭ-ob-ul′-bæ
Er-ĭ-oc-al′-lĭ-a
Er-ĭ-oc-am′-pa
er-ĭ-oc-ar′-pa
Er-ĭ-oc-ar′-pha
er-ĭ-oc-ar′-pon
Er-ĭ-oc-au′-lon
Er-ĭ-oc-au-lo′-nĕ-æ
er-ĭ-oc-eph′-al-a
Er-ĭ-och-i′-lus
Er-ĭ-oc-ne′-ma
Er-ĭ-oc′-om-a
Er-ĭ-od-en′-dron
Er-ĭ-og′-on-um
Er-ĭ-og-yn′-ĭ-a
Er-ĭ-ol-æ′-nĕ-æ
Er-ĭ-op-ap′-pus
Er-ĭ-oph′-or-um
Er-ĭ-oph-yl′-lum
Er-ĭ-op′-sis
Er-ĭ-os-e′-ma
Er-ĭ-os-per′-mum
Er-ĭ-os-te′-mōn
Er-ĭ-os′-tom-um
Er-iph-i′-a
Er-is-y′-phe
Er-is-y′-phĕ-æ
Er-ith′-al-is
Er-it-rich′-ĭ-um
er-min-i′-num
Er-no′-dĕ-a
Er-od-en′-dron
Er-o′-dĭ-um
e-ro′-sa
Er-o′-tĕ-um
Er-pet′-ĭ-on
er-ra′-tic-a
e-rub-es′-cens
Er′-vum
E-ryng′-ĭ-um
Er-ys′-im-um
Er-ys-i′-phe*
Er-ys-i′-phe′-æ
Er-yth-e′-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Er-yth-ræ′-a
Er-yth-ri′-na
er-yth-roc-ar′-pum
er-yth-roc-eph′-al-us
Er-yth-roch-æ′-te
Er-yth-roch-i′-ton
Er-yth-rod′-an-um
Er-yth-ro′-dēs
Er-yth-rol-æ′-na
er-yth-ron-e′-ma
Er-yth-ro′-nĭ-um
er-yth-roph-æ′-a
Er-yth-roph-lœ′-um
er-yth-rop′-od-a
er-yth-rop′-ter-us
er-yth′-rop-us
er-yth-ror′-ach-is*
Er-yth-ror′-chis
Er-yth-rorh-i′-za
er-yth-ros-o′-rum
er-yth-ros-tic′-tum
Er-yth-ro′-tis
er-yth-rox-anth′-um
Er-yth-rox-yl′-ĕ-æ
Er-yth-rox′-yl-on
Es-cal-lo′-nĭ-a
Es-cal-lo′-nĭ-æ
Es-che′-rĭ-a
Esch-scholtz′-ĭ-a
es-cul-en′-ta
E′-scul-us
Es-mer-al′-da
Es-pel-e′-tĭ-a
Es-tra′-dæ
e-strĭ-a′-tus
Eth-an′-ĕ-um
Et-rus′-ca
e-tu-ber-o′-sum
Eu-ad-e′-nĭ-a
Eu-cal-yp′-tus
Eu-chæ′-tis
Eu-char-id′-ĭ-um
Eu′-char-is
Eu-chi′-lus
Eu-chlæ′-na
Eu-chro′-ma*
Eu-cle′-a
Eu-cni′-de*
Eu-co-do′-nĭ-a
Eu′-com-is
Eu-cros′-ĭ-a
eu-cros-ĭ-ŏ-ĭ′-dēs
Euc-ryph′-ĭ-a
Eu-des′-mĭ-a
Eu′-dol-on
Eu-ge′-nĭ-a
Eu-ge′-nie
eu-ge-nĭ-ŏ-ĭ′-dēs
eu-glŏs′-sa
Eu-lal′-ĭ-a
Eu-loph′-ĭ-a
eu′-loph-um
Eu-nar-cis′-sus
Eu-nom′-ĭ-a
Eu-o′-nym-i
Eu-o′-nym-us*
Eu-os′-ma
Eu-pæ-cil′-ĭ-a
eu-pat-or′-ĭ-ŏ-ĭ′-dēs
Eu-pat-or′-ĭ-um
eu-phleb′-ĭ-a*
Eu-phor′-bĭ-a
Eu-phor-bĭ-a′-cĕ-æ
Eu-phras′-ĭ-a
Eu-phras′-ĭ-ĕ-æ
Eu-plex-op′-ter-a
Eu-pod′-ĭ-um
Eu-pœ-cil′-ĭ-a
Eu-po-ma′-tĭ-a
Eup′-ter-yx
eu-ro-pæ′-a
Eu′-rў-a
Eu′-rў-ăl-e
Eu-rў-an′-dra
Eu-ryb′-ĭ-a
Eu-ryc′-lēs
Eu-ryc-li′-ne
Eu-ryg-an′-ĭ-a
eu-rў-ŏ-ĭ′-dēs
Eu′-rў-ōps
Eu′-scaph-is*
Eu-sel-a′-gin-el′-la
eu-so′-rum
Eu-steg′-ĭ-a
Eu-steph′-ĭ-a
Eu′-stom-a
Eu′-streph-us
Eu′-styl-is
Eu-tax′-ĭ-a
Eu-ter′-pe
Eu′-thal-ēs
Eu′-toc-a
Eu-u′-ra
eux-an′-thin-um
Eu-xen′-ĭ-a
E-val-la′-rĭ-a
Ev-ans′-ĭ-a
Ev-ans-ĭ-a′-nus
e-vec′-tum
Ev-el-y′-na
E-vol′-vul-us
Ew-er-ĭ-a′-na
Ew-ers′-ĭ-i
Ex′-ac-um
ex-al-ta′-ta
ex-as-per-a′-tum
Ex-cæ-ca′-rĭ-a
ex-cav-a′-tum
ex-cel′-lens
ex-cel′-sa
ex-ci′-sa
ex-cla-ma′-tĭ-o′-nis
ex-cul′-ta
ex-ig′-ŭ-a
ex-im′-ĭ-a
Ex-it-e′-lĭ-a
ex-it-ĭ-o′-sum
Ex-o′-as-cus
Ex-o′-car-pus
Ex-o′-chor-da
Ex-o-gon′-ĭ-um*
ex-ol-e′-ta
ex-on-ĭ-en′-sis
ex-o-rhi′-za
ex-or-na′-ta
Ex-o-stem′-ma
Ex-o-thos-te′-mŏn
ex-o′-tic-a
ex-pan′-sum
ex-sca′-pa
ex-sculp′-ta
ex-sec′-tum
ex-ser′-ta
ex-sur′-gens
ex-ten′-sum
ex-tinc-to′-rĭ-ɹ
ex-u′-dans
ex-uv-ĭ-a′-ta
Ey′-rĕ-a
Ey′-rĕ-i
Ey-rie′-sĭ-i
Ey-sen-hardt′-ĭ-a

Fab′-a
fab-a′-cĕ-a
Fab-a′-ce-æ
Fab-a′-go
Fab-ĭ-a′-na
Fab-ric′-ĭ-a
fac-e′-tum
Fad-yen′-ĭ-a
Fad-yen′-ĭ-i
Fa-ga′-ra
Fa-gel′-ĭ-a
Fa′-gi
fa-gif-ol′-ĭ-a
fa-gin′-ĕ-a
Fa-gop-y′-rum
Fag-ræ′-a
Fa′-gus
Fair-ie-a′-na
fal-ca′-ta
fal-cif-ol′-ĭ-a
fal-cif-or′-me
fal-cin-el′-lum
Fal-con-e′-ra
Fal-con-e′-ri
Fal-ken-ber′-gĭ-i
Fal′-kĭ-a
falk-land′-ic-um
fal′-lax
Fal-lu′-gĭ-a
Far-a′-mĕ-a
Far′-far-a
Far-fu′-gĭ-um
far-i-na′-cĕ-a
far-i-nif′-er-a
far-i-no′-sa
Far-ley-en′-sĕ
Far′-mer-i
Far-ne-sĭ-a′-na
Far′-rer-æ
Far-se′-tĭ-a

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

fas-cel-i′-na
fas-cĭ-a′-ta
fas-cic-ul-a′-ris
fas-cic-ul-a′-ta
fas-cin-a′-tor
fas-ti-gĭ-a′-ta
fas-tu-o′-sa
Fat-rœ′-a
Fat′-sĭ-a
Fau-con-ne′-ti
fav′-id-um
fav-o′-sa
feb-rif′-ug-um
Fe′-dĭ-a*
Fedt-schen′-kŏ-i
Fe′-ĕ-a
Fe′-ĕ-i
fe-je-en′-sĕ
Fe-lic′-ĭ-a
fe-li′-na
fel-os′-ma
Fend′-ler-i
fen-es-tra′-lis
fen-es-tra′-tum
fen-es-trel′-la
fen′-nic-a
Fen-u′-sa
Fenz′-lĭ-a
Fenz-lĭ-a′-na
Fenz′-lĭ-i
Fer-din-an′-da
Fer-ei′-rĭ-a
Fer-gus-so′-ni
Fer-nan′-dæ
Fer-nand-e-sĭ-a′-num
Fer-nan-de′-zĭ-a
Fer-ne′-lĭ-a
fer-o-cis′-sim-us
Fe-ro′-nĭ-a
fer′-ox
Fer-ra′-rĕ-a
Fer-ra′-rĕ-ol-a
fer′-rĕ-a
Fer′-rĕ-ol-a
fer-rĕ-e′-ren-sĕ
fer-ru-gin′-ĕ-a
Fer′-ul-a
fer-ul-æ-fol′-ĭ-a
Fer-ul-a′-go
fes-ti′-va
Fes-tu′-ca
Feu-il-læ′-a
Feu-il′-lĕ-i
Fev-il′-lĕ-a
Fi-bril-la′-rĭ-a
fi-bro′-sa
Fi-ca′-rĭ-a
fi-cif-ol′-ĭ-a
fi-cŏ-i′-dĕ-a
Fi-cŏ-i′-dĕ-æ
Fi′-cus
Fi-do′-nĭ-a
Field′-ĭ-a
Field′-ĭ-æ
Field-ing′-ĭ-i
fi-jen′-sis
fi-lam-en-to′-sa
fi-la′-rĕ
Fildes′-i
fi-lic-au′-lis
Fil′-ic-ēs*
fil-ic-if-ol′-ĭ-a
fil-ic-i′-na
fil-ic-ŏ-i′-dēs
Fil-ic′-ul-a
fi-lif′-er-a
fi-lif-ol′-ĭ-um*
fi-lif-or′-mis
Fi-lip-en′-dul-a
fi-lip-en′-dul-if-ol′-ĭ-um
Fi′-lip-ēs
Fil′-ix-fœ′-min-a
Fil′-ix-mas′
fim′-brĭ-a
Fim-brĭ-a′-rĭ-a
fim-brĭ-a′-ta
Find-ley-a′-num
Fin-ed-on-en′-sis
fir′-ma
fir-ma′-ta
Fis-che′-ra
Fis-che′-ri
Fis-che′-rĭ-a
Fis-che′-rĭ-a′-na
Fis-se′-nĭ-a
fis-sif-ol′-ĭ-a
Fis-sil′-ĭ-a
fis′-sum
Fis-tul-i′-na
fis-tul-o′-sa
Fit-to′-nĭ-a
Fitz-ger-al′-di
Fitz-roy′-a
fla-bel-la′-ta*
fla-bel-lif-ol′-ĭ-um
fla-bel-lif-or′-mis
fla-bel-lul-a′-ta
flac′-cid-a
Flac-our′-tĭ-a
Flac-our′-tĭ-ĕ-æ
flag-el-la′-ris*
flag-el-la′-ta
flag-el-lif′-er-um
flag-el-lif-or′-mis
flag-el′-lum
flam′-mĕ-a
Flam′-mul-a
fla′-va*
fla′-vens
fla′-vĕ-ol-um
Fla-ve′-rĭ-a
fla-ves′-cens
fla-vic′-om-a
fla′-vid-us
fla-vis-pi′-na
fla-vis′-sim-um
fla-vo′-sum
fla′-vus
Flem-ing′-i
flex′-il-is
flex′-um
flex-ŭ-o′-sa
Flin-der′-sĭ-a
floc-co′-sa
flo-ra′-lis
flo′-re-al′-bo
flo-ren-ti′-na
flo′-re-ple′-no
flo-ric-un′-da
flo-ric′-ol-a
flo′-rid-a*
*flor-id-a′-num**
flor-id-en′-sis
Flörk-ĭ-a′-na
flo-rul-en′-ta
Flos-cuc-u′-li
flos-cul-o′-rum
Flueg′-gĕ-a
Flüg′-gĕ-a
flŭ′-ĭt-ans
fluv-ĭ-a′-til-is
fœ′-min-a
fœ-min′-ĕ-a
fœ-nic-ul-a′-cĕ-um
Fœ-nic′-ul-um
fœ-nis-ec′-ĭ-i
Fœ′-num-Græ′-cum
Fœt-at-ax′-us
fœt′-id-a
Fœt-id′-ĭ-a
fœt-id-is′-sim-a
fol′-ĭ-i*
fol′-ĭ-is-au′-rĕ-is
fol-ĭ-ol-o′-sa
fol-ĭ-o′-sa
fol-lic-ul-a′-ris
Fon-tan-e′-sĭ-a
Fon-tan-e′-sĭ-a′-na
Fon-tan-e′-sĭ-i
fon-ta′-num
Fon-tin-a′-lis
Foot′-i
Forbes-ĭ-a′-num
Forbes′-ĭ-i
Ford′-ĭ-i
for-fic-a′-lis
For-fic′-ul-a
for-mi′-cæ-for′-mis
For-mi′-cid-æ
for-mo′-sa
for-mo-sa′-na
for-mo-sis′-sim-a
For-res′-tĭ-a
Fors-kol′-ĕ-i
Fors′-ter-a
Fors′-ter-i
Fors-ter-ĭ-a′-num
For-sy′-thĭ-a
For-tu′-nĕ-a
For-tu-nĕ-a′-na
For-tu′-nĕ-i
fos-sul-a′-tus
Foth-er-gil′-la
Foth-er-gil′-lĭ-a
Foth-er-gil′-lĭ-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

foth-er-gil-lŏ-i′-dēs
Fou-qui-e′-ra
Fou-qui-e′-rĕ-æ
Four-croy′-a
Four-nĭ-e′-ri
fov-ĕ-a′-rum
fov-ĕ-a′-tum
Fov-ĕ-ol-a′-rĭ-a
Foх′-ĭ-i
frac-tif-lex′-a
Fra-ga′-rĭ-a*
fra-ga′-rĭ-ŏ-i′-dēs
fra-gif′-er-a
frag-il-if-ol′-ĭ-a
frag′-il-is
fra′-grans
fra-gran-tis′-sim-a
Fran-cis′-cĕ-a
Fran-co′-a
Fran-co′-ĕ-æ
Fran-co′-nis
Frang′-ul-a
Frank-en′-ĭ-a
Frank-en-ĭ-a′-cĕ-æ
frank-en-ĭ-ŏ-i′-dēs
Frank-lin′-ĭ-i
Fran-so-nĭ-a′-na
Fra′-ser-a
Fra′-ser-i
frax-in′-ĕ-a
Frax-in′-ĕ-æ
Frax-in-el′-la
frax-in-if-ol′-ĭ-um
frax-in-ĭ-if-ol′-ĭ-um
Frax′-in-us
Fred-er-i′-ci
Free-man′-ĭ-i
Frees′-ĭ-a
Fre-mon′-ti
Fre-mon′-tĭ-a
Fre-mon-tĭ-a′-na
Fre-mon′-tĭ-i
Fre-nel′-a
Frey-cin-e′-tĭ-a
Frez-ĭ-e′-ra
Fri-der-i′-ci-Au-gus′-ti
Fried-richs-thal′-ĭ-a
Fries′-ĭ-a
fri′-gid-a
Fris′-chĭ-i
Fris-el′-lĭ-æ
Frit-il-la′-rĭ-a
Friv-al′-dĭ-a
Frœ′-bel-i
Frœ-bel′-lĭ-i
Frœ-lich′-ĭ-a
Frol-o′-rĭ-a
Fro-lo′-vĭ-a
fron′-dĕ-a
fron-do′-sa
fruc-tig′-en-um
fruc-tip-en′-dul-a
fruc′-tu-lu′-tĕ-a
Frut-es′-ca*
frut-es′-cens
frut-e-to′-rum
frut′-ex
frut-ic-o′-sum
frut-ic-ul-o′-sum
fu-ca′-tum
*Fuch′-sĭ-a**
fuch-sĭ-æ-fol′-ĭ-a
fuch-sĭ-ŏ-i′-dēs
fu-cif-or′-mis
Fuck-el-ĭ-a′-na
fug′-ax
Fu-go′-sĭ-a
Ful-chir-o′-nĭ-a
ful′-gens
ful′-gid-a
ful-ham-en′-sis
fu-li-gin-o′-sa
Ful-lo′-num
ful-va′-ta
ful-ves′-cens
ful′-vus
Fu-ma′-go
Fu-ma′-na
Fu-ma′-rĭ-a
Fu-ma-rĭ-a′-cĕ-æ
fu-ma-rĭ-æ-fol′-ĭ-a
Fu-ma′-rĭ-ĕ-æ
fu-ma-rĭ-ŏ-i′-dēs
fu-mip-en′-nis
fu-na′-lis
Funck′-ĭ-i
fu-neb-ra′-na
fu-ne′-bris
fu-nes′-tum
Fun′-gi
fung-o′-sa
fu-nic-ul-a′-ta
Fu-nic′-ul-us
fu-nif′-er-a
Funk′-ĭ-a
Funk-ĭ-a′-num
fur′-cans
fur-ca′-tus
Fur-cræ′-a
fur′-cul-a
fur′-ens
fur-fur-a′-cĕ-a
Fur-sten-ber′-gi
Fu-sa′-rĭ-um
fus′-ca
fus-ca′-ta
fus-ces′-cens
fus′-cif-rons
fus′-co-vir′-id-is
fus′-cum
Fu-sic-lad′-ĭ-um
fu-sif-or′-mis*
Fu-sis-por′-ĭ-um
Fu-tok-ad-su′-ra
Fytch-ĭ-a′-num

Gœrt′-ner-a
Gœrt-ner-ĭ-a′-num

Ga′-gĕ-a
Gagn-eb-i′-na
Gail-lar′-dĭ-a
Gair-ĭ-a′-num
Gal-ac′-tĭ-a*
Gal-ac-ti′-tēs
Gal-ac-tod-en′-dron
Gal-ang′-a
gal-anth-if-ol′-ĭ-us
Gal-anth′-us
Gal-at-el′-la
Gal′-ax
Gal-ax′-ĭ-a
gal-ban-if′-lŭ-a
Gal′-ban-um
Ga′-le
Gal-ĕ-an′-dra
Gal-ĕ-a′-ta
Gal-e′-dup-a
Gal-e′-ga
gal-e′-gif-ol′-ĭ-a
gal-e′-gif-or′-mis
gal-e′-gŏ-i′-dēs
Gal-ĕ-ob′-dol-on
Gal-e-og-lōs′-sum
Gal′-ĕ-ol-a
Gal-ĕ-op′-sis
Gal-ĕ-ot′-tĕ-i
Gal-ĕ-ot′-tĭ
Gal-ĕ-ot′-tĭ-a
Gal-ĕ-ot-tĭ-a′-na
gal-e′-ric-ul-a′-ta
Gal-ĭ-a′-cĕ-æ
Gal-in-so′-gĕ-a
gal-ĭ-ŏ-i′-dēs
Gal-ip-e′-a
Gal′-ĭ-um
gal-la′-rum
gal′-li
gal′-lic-a
gal-lic′-ol-a
gal-lic-ŏ-i′-dēs
Gal′-lĭ-i
*Gal-phi′-mĭ-a**
Gal-to′-nĭ-a
Gal-va′-nĭ-a
Gam′-bĭ-er
gam-bo′-sus
Gam′-ma
Gam-mie-a′-na
Gam-och′-lam-ys
gan-dav-en′-sis
gan-dĭ-en′-sis
gan-glĭ-o′-nif-or′-mis
Gan-ym-e′-dēs
gan-ym-e′-dŏ-i′-dēs
Gar-ci-a′-na
Gar-ci′-nĭ-a
Gar-de′-ni
Gar-de′-nĭ-a
gar-de-ni-ŏ-ĭ′-dēs
Gard′-ner-i
Gard-ner-ĭ-a′-na
Gard-ner′-ĭ-i
Gar-do′-qui-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

gar-gan′-ic-a
Gar-gan′-tŭ-a
Gar-id-el′-la
gar-ĭ-ep′-in-um
Gar-nĭ-e′-rĭ-a′-na
Gar-rex-ĭ-a′-na
Gar′-rў-a
Gar-rў-a′-cĕ-æ
Gar-u′-ga
Ga-sip′-ă-és
Gas-kel-lĭ-a′-na
Gas-te′-rĭ-a
Gas-to′-ni
Gas-to′-nĭ-a
Gas-troc-ar′-pha
Gas-tro′-dĭ-a
Gas-trol-ob′-ĭ-um
Gas-trom-er′-ĭ-a
Gas-tron-e′-ma
Gau-dich-au′-dĭ-a
Gau-dich-au-dĭ-a′-num
Gau-dich-au′-dĭ-i
Gaul-the′-rĭ-a
Gau′-ra
Gaus′-sĭ-a
Gau-tĭ-e′-ri
Gay′-a
Gay-a′-num
Gay-lus-sa′-cĭ-a
Ga-za′-nĭ-a
Ge-as′-ter
Geb-an′-ga
geb-el′-ĭ-a
Geb-le′-ra
Ge-er′-ĭ-a
ge-if-ol′-ĭ-a
Geis-so′-is
Geis-som-er′-ĭ-a
Geis-sŏ-rhi′-za
Gel-as-i′-ne
gel′-id-a
Gel-o′-nĭ-um
Gel-sem′-ĭ-ĕ-æ
Gel-sem′-ĭ-um
gem-in-a′-ta*
gem-in-if-lo′-ra
gem′-ma
gem′-mæ
gem-ma′-ta
gem-mif′-er-a
gem-mip′-ar-a
gem-on-en′-sĕ
Gen-dar-us′-sa
Gen-et-yl′-lis
gen-e-ven′-sis
gen-ic-ul-a′-ta
Gen-i′-pa
Gen-is′-ta
gen-is-tæ-fol′-ĭ-a
gen-is-tif-ol′-ĭ-a
gen-is-tŏ-i′-dēs
Genk′-wa
Gen-os-i′-ris
Gen-tĭ-a′-na
Gen-tĭ-a′-næ
Gen-tĭ-a-nel′-la
gen-tĭ-a-nŏ-i′-dēs
gen-ti′-lis
Ge-od-o′-rum
Geof-fræ′-a
Geof-froy′-a
Geof-froy′-i
ge-ŏ-i′-dēs
gĕ-o-met′-ric-a
Gĕ-o-met′-rin-a
Gĕ-o′-nom-a
gĕ-o-nom-if-or′-mis
Gĕ-oph′-il-us
Gĕ-or′-ch-is
geor-gĭ-a′-na
Geor-gi′-na
Ge-ot-ru′-pēs
Ger-an-ĭ-a′-cĕ-æ
ger-an-ĭ-æ-fol′-ĭ-a
ger-an-if-ol′-ĭ-a
ger-an-ĭ-ŏ-i′-dēs
Ger-an′-ĭ-um*
Ger-ar′-dĭ-a
Ger-ar-dĭ-a′-na
Ger-ar′-dĭ-ĕ-æ
Ger-as-can′-thus
Ger-be′-rĭ-a
Ger-da′-rĭ-a
Ger-mai′-nĭ-i
Ger-ma′-nĕ-a
ger-ma′-nic-a
Ger-ol-tĭ-a′-na
Ger-op-o′-gōn*
Ger-rar′-dĭ
*Ges-ne′-ra**
Ges-ne-ra′-cĕ-æ
ges-ne′-ræ-flo′-ra
Ges-ne′-rĭ-a
Ges-ne′-rĭ-a′-na
Ges-ne′-rĭ-a′-næ
ges-ne-rŏ-i′-dēs
Ge-thyl′-lis
Ge-thy′-ra
Ge′-um
Gheis-bech′-tĭ-i
Ghel-linck′-ĭ-i
Ghies-bregh-tĭ-a′-na
Ghies-bregh′-tĭ-i
Ghi′-nĭ-a
gib′-ba
gib-ber-o′-sa
gib-bif-lo′-ra
gib-bo′-sum
Gibbs-ĭ-a′-na
gib-ral-tar′-ic-a
Gib-son′-ĭ-i
Gig-ant-ab′-ĭ-ēs
gig-ant-e′-um
gĭg-ant′-ic-a
gig′-as
Gil-bert′-ĭ-a
Gil-bert′-ĭ-i
Gil′-bey-i
Gil′-ĭ-a
Gil-le′-nĭ-a
Gil-les′-ĭ-i
Gil-lies′-ĭ-a
Gil-lies′-ĭ-i
Gil′-lĭ-i
Gin-gin′-sĭ-a
Gink′-go
Gin-nal′-la
Gi-re-ou-dĭ-a′-na
Gith-a′-go
glab-el′-la*
glab′-er
glab-er′-rim-a
glab′-ra
glab-ra′-ta
glab-res′-cens
glab-ric′-ol-lis
glab-rĭ-us′-cul-us
glac-ĭ-a′-lis
glad-ĭ-a′-ta
glad′-ĭ-ol-if-lo′-ra
Glad′-ĭ-ol-us*
glan′-dĭ-um
glan-dul-if′-er-a
glan-dul-ig′-er-a
glan-dul-o′-sa
Glas-i-o′-vĭ-i
glast-if-ol′-ĭ-a
glau′-ca
glau′-ces-cens
glau-cif-ol′-ĭ-a
glau-cĭ-if-ol′-ĭ-um
glau′-cin-um
Glau′-cĭ-um
glau-coph-yl′-la
Glaux
Glaz-ĭ-o′-va
Gle-cho′-ma
Gled-its′-chĭ-a
Gled-it′-sĭ-a
Glehn′-ĭ-i
Glei-che′-nĭ-a
Glei-che-nĭ-a′-cĕ-æ
Glob′-ba
glob-if′-er-um
glob-if-lo′-rum
glob-o′-sa
Glob-ul-a′-rĭ-a
glob-ul-a-rĭ-æ-fol′-ĭ-um
Glob-ul-a′-rĭ-ĕ-æ
glob-ul-a′-ris
Glob-ul-e′-a
glob′-ul-i
glob-ul-if′-er-a
glob-ul-o′-sa
Glœ-os-por′-ĭ-um
glom-er-a′-ta
Glon-er′-ĭ-a
glo′-rĭ-a
Glo-rĭ-o′-sa
glo-rĭ-o-sŏ-i′-dēs
glo-rĭ-o′-sum
Glōs-san′-thus*
Glos′-sar-rhēn
Glōs-sas′-pis
Glōs-soc-om′-ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Glōs-so′-dĭ-a
glōs-som-ys′-tax
Glōs′-sul-a
Glōt-tid′-ĭ-um
Glox-in′-ĭ-a
*glox-in-*ĭ-æ-flo′-ra
*glox-in-*if-ol′-ĭ-us
glu-ma′-cĕ-a
glu-tin-o′-sa
Glyc-er′-ĭ-a
Glyc′-in-e
glyc-in-if-ol′-ĭ-a
Glyc-os′-mis
glyc-yph-yl′-los
Glyc-yr-rhi′-za*
Glym′-ĭ-i
Glyph-æ′-a
Glyph-os-per′-ma
Glyp-tos′-trob-us
Gmel-i′-na
Gmel-i′-ni
gnaph-al-ĭ-ŏ-i′-dēs
Gnaph-al′-ĭ-um
Gne-ta′-cĕ-æ
Gni′-dĭ-a
God-e′-tĭ-a
God′-oy-a
God-win′-ĭ-a
Goe-bel′-ĭ-i
Gŏ-er′-ĭ-us
Goe′-thĕ-a
*gog-o-*en′-sis
Gold-fus′-sĭ-a
Gol-die-a′-na
Gol′-die-i
Gom′-phĭ-a
Gom-phol-ob′-ĭ-um
Gom-phos′-tyl-is
Gom-phre′-na
Gon-at-anth′-us
gon-at-o′-dēs
Gon-at′-op-us
Gon′-gon-ha
Gong-o′-ra
gong-yl-o′-dēs
Go-nĭ-oph-leb′-ĭ-um
Go-nĭ-op′-ter-is
Go-noc′-al-yx
Go-nol′-ob-us
Go-nos-te′-mōn
Good-en-o′-vĭ-ĕ-æ
Good′-ĭ-a
Good′-yer-a
Gor-do′-nĭ-a
Gor-do′-nĭ-a′-nus
Gor-in′-gĭ-a′-num
Gos-syp′-ĭ-um
Goth-of-re′-da
Gott-schal′-ckĕ-i
Gou-a′-ni
Gou-a′-nĭ-a
Gou-do′-tĭ-i
Gov-e′-nĭ-a
Gov-e′-nĭ-a′-na
Gov-in-do′-vĭ-a
Gow′-er-æ
Gow-er′-ĭ-i
Grab-ow′-skĭ-a
Grac-il-a′-rĭ-a
grac′-il-ĕ
grac-il-en′-ta
grac-il-ic-or′-nis
Grac-il′-im-a
grac-il-li′-na
græ′-ca
Græf′-fĕ-i
Græf′-fer-i
Græll′-sĭ-i
Gra′-ham-i
*Gra-ham-*ĭ-a′-na
Gra-min′-ĕ-æ
gra-min′-ĕ-us
gra-min-if-ol′-ĭ-a
gra′-min-is
Gram-man′-gis
Gram-man′-thēs
Gram-mat-oc-ar′-pus
Gram-mat-oph-yl′-lum
Gram-mi′-tis
gram-un′-tĭ-a
gran-a-den′-sis
Gra-na′-rĭ-us
*gran-a-*ten′-sĕ
Gra-na′-tum*
gran′-dĕ
gran′-dic-eps
gran-dic-us′-pis
gran-did-en-ta′-ta
gran-dif-lo′-ra
gran-dif-ol′-ĭ-a
gran-dif-or′-mis
gran-din-o′-sa
gran-dip-le′-nus
gran-dip-unc-ta′-ta
gran′-dis
Gran′-tæ
Gran′-tĭ-i
gra-nul-a′-ta
gra-nul-o′-sa
Gra′-num
Graph-ol′-ith-a
Grap-toph-yl′-lum
gra′-ta
Gra′-tĭ-ol-a
Gra-tĭ-ol′-ĕ-æ
gra-tĭ-o′-sa
gra-tĭ-o-sis′-sim-um
gra-tis′-sim-a
grav′-ĕ-ol-ens
Graves′-ĭ-a
Gray′-i
*Green-*ĭ-a′-na
Green′-ĭ-i
Green-o′-vĭ-a
Greg′-gĭ-i
Greg-or′-ĭ-a
Greg-or′-ĭ-i
Greig′-i
Greig′-ĭ-a
Greig′-ĭ-i
Gren-vil′-lĕ-a
Gren-vil′-lĕ-æ
Grev-il′-lĕ-a
Grev-il-lĕ-a′-na
Grev-il′-lĕ-i
Grew′-ĭ-a
*grew-*ĭ-æ-flo′-ra
*grew-*ĭ-ŏ-i′-dēs
Grey-a′-na
Grey′-ĭ-a
Gri′-as
Grie′-vĕ-i
Grif-fin′-ĭ-a
Grif-fin′-ĭ-i
Grif-fith-ĭ-a′-na
Grif-fith′-ĭ-i
Grin-de′-lĭ-a
Grise-bach′-ĭ-a
Grise-bach-ĭ-a′-na
Gri-sel-i′-nĭ-a
Gris′-le-a
Gro′-bў-a
Gro′-bў-i
Gron-o′-vĕ-a
gros-sil-ab′-ris
Gros-sul-a′-rĭ-a
Gros-sul-a′-rĭ-a′-cĕ-æ
Gros-sul-a′-rĭ-æ
gros-sul-a-rĭ-a′-ta
Grub′-bĭ-a
Gryl′-lid-æ
Gryl-lo-tal′-pa
Gryl′-lus
Gu-a′-co
guad-al-u-pen′-sis
Guag-neb-i′-na
Gua′-ĭ-ac-um
Gual-the′-rĭ-a
Gua-pe′-ba
Gua′-re-a
gua-rŏ-i′-dēs
gua-tem-a-len′-sĕ
Guat-te′-rĭ-a
Gua′-va
Gua-zu′-ma
Guet-tār′-da
Gue-vi′-na
gui-a-nen′-sis
Gui-chen-o′-tĭ-a
Guil-an-di′-na
Guil-foy′-lĕ-i
Guil-ĕ-el′-ma
Guil-ĭ-el′-mĭ
guin-ĕ-en′-sis
Gui-zo′-tĭ-a
Gul-den-stad-tĭ-a′-na
gum′-mif-er
gum-mif′-er-um
Gun-del′-ĭ-a
Gun-del-sheim-er′-ĭ-a
*Gun-ne′-ra**
Gun-ne-ra′-cĕ-æ
Gun′-nĭ-a
Gun-nĭ-a′-na

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā*′-lmist; ĕ as in sl*ĕn*′-der; ē as in v*ē*′-ined; ĭ as in thĭn; ī as in mach-*ī*′-nist; ŏ as in r*ŏt*′-ten; ō as in v*ō*′-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū*′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Gun′-nĭ-i
Gun-nis-o′-ni
gur-wal′-ic-um
Gus-so-nĭ-a′-na
Gus-ta′-vi
Gus-ta′-vĭ-a
Guth-rie-a′-na
Gut-ĕ-er-re′-zĭ-a
gut′-ta
gut-ta′-ta
Gut-tif′-er-æ
gut-tul-a′-tum
guy-a-nen′-sis
Guz-man′-nĭ-a
Gym-nad-e′-nĭ-a
gym-nan′-tha
Gym-ne′-ma
gym-noc-ar′-pa
Gym-noc′-lad-us
Gym-nog-ram′-me
Gym-nol-o′-mĭ-a
Gym-nop′-sis
Gym-nop′-ter-is
gym-nos-per-mŏ-i′-dēs
Gym-nos-por-ang′-ĭ-um
Gym-nos-tach′-ĭ-um
Gym-nos′-tach-ys
Gym-noth-e′-ca
Gym′-noth-rix
Gyn-an-dri′-ris
Gyn-an-drop′-sis*
Gyn-er′-ĭ-um
Gyn-he-te′-rĭ-a
Gyn-oc-eph′-al-a
Gyn-oph′-or-a
Gyn-op-leu′-ra
Gyn-ox′-ys
Gyn-u′-ra
Gyp-soph′-il-a
Gy-ran′-dra*
gy′-rans
gy-rob-ul′-bon
Gy-roc-ar′-pĕ-æ
Gy-ro′-mĭ-a
Gy-ros′-tach-ys
Gy-roth-e′-ca

Haa-gĕ-a′-num
Haas′-tĭ-i
Hab-e-na′-rĭ-a
Hab-er′-lĕ-a
Hab-litz′-ĭ-a
Hab-litz-ĭ-a′-na
Hab-ran′-thus
Hab-roth-am′-nus
Hack-el-ĭ-a′-na
Hac-quet′-ĭ-a
Had-e′-na
Had-wen′-ĭ-i
Hœck-er′-ĭ-a
Hæm-ad-ic′-tў-on
Hæm-an′-thus
Hæm-a′-rĭ-a
hæm-at-och-i′-lum
hæm-at-och′-rŏ-um
Hæm-at-ox′-yl-on
Hæm-och′-ar-is
Hæm-od-o-ra′-cĕ-æ
Hæm-od-o′-rum
hæm-or-rho-id′-al-is
Hœn′-kĕ-a
Hœn′-sler-a
Hag-æ′-a
Ha′-ger-i
Hahn′-i
Ha′-kĕ-a
ha′-kĕ-æ-fol′-ĭ-a
hal-ep-en′-sĕ
hal-ep′-pic-a
Hales′-ĭ-a
Hal-ford′-i
Hal′-ĭ-a
hal-im-if-ol′-ĭ-a
Hal-im′-ĭ-um
Hal-im-od-en′-dron
hal-ĭ-o′-tid-ĕ-a
Hal-lĕ-a′-na
Hal-le′-ri
Hal-le′-ĭ-a
Hal′-lĭ-a
Hal′-lĭ-i
hal-oph′-il-a
Hal-or-a′-gĕ-æ
Hal′-tic-a
Ham-a-lĕ-a′-na
Ham-am-e-lid′-ĕ-æ
Ham-am-e′-lis
ha-ma′-ta
Ham-el′-ĭ-a
Ham-il-to′-ni
Ham-il-to′-nĭ-a
Ham-il-to-nĭ-a′-nus
Ham-mond′-i
ha-mo′-sa
Han-bur′-ĭ-i
Han-bur-y-a′-num
Han-cor′-nĭ-a
Hands-worth-en′-sis
Han-so′-ni
Hap-loch-i′-lus
Hap-lop-ap′-pus
Hap-lop-et′-al-um
Hap-loph-yl′-lum
Har-den-ber′-gĭ-a
Har′-dĭ-i
Hard-wick′-ĭ-a
Har-i′-na
Har-lan′-dĭ-i
Har′-mal-a
Har-on′-ga
Har-pag-oph′-yt-um
Har-pal′-ĭ-um
Har′-pal-us
Har-pal′-ye-e
har-pĕ-o′-dēs
har-poph-yl′-la
Har-ra′-chĭ-a
Har-ring-to′-nĭ-a′-na
Har′-ris-i
Har-ris-ĭ-a′-na
Har-ris′-ĭ-i
Har-ris-o′-nĭ-a
Har-ris-o′-nĭ-æ
Har-ris-o′-nĭ-a′-num
Har-ry-a′-na
Hart′-ĭ-i
Hart-man′-ni
Hart-man′-nĭ-a
Hart-nel′-li
Har-tog′-ĭ-a
Hart-weg′-ĭ-a
Hart-weg-ĭ-a′-na
Hart-weg′-ĭ-i
Hart-wies-ĭ-a′-na
Har-vey-a′-na
Har-wood-ĭ-a′-num
Has-ska′-rĭ-i
has-ta′-ta
has-tif′-er-a
has-til-ab′-ĭ-um
has-ti′-lis
Ha-sting′-ĭ-a
Hauss-knecht′-ĭ-i
Hav-an-en′-sis
Haw′-ker-i
Haw-orth′-ĭ-a
Haw-orth′-ĭ-i
Haw-tay-nĕ-a′-na
Hay-lodg-en′-sis
Hay-nal-dĭ-a′-num
Hay′-nĭ-i
He-be-an′-dra*
he-be-car′-pum
He-be′-clad-us
He-be-cli′-nĭ-um
he-be′-gyn-um
Heb-el′-ĭ-a
Heb-en-stre′-tĭ-a
heb-ra′-ic-um
Hec-at-e′-a
Hech′-tĕ-a
he-cis′-toph-yl′-la
He-dar-o′-ma
Hed′-er-a
hed-er-a′-cĕ-a
Hed-er-a′-cĕ-æ
hed-er-æ-fol′-ĭ-um
Hed-wig′-ĭ-a
He′-dў-a*
He-dych′-ĭ-um
he-dў-os′-mum
He-dў-o′-tis
he-dys-ar-ŏ-ĭ′-dēs
He-dys′-ar-um
He-dys′-cep-e
Hee′-rĭ-a
Hee′-rĭ-i
Hei′-mĭ-a
Hein′-sĭ-a
Hein′-tzĭ-a
Heis-te′-rĭ-a
Hek-at-er-os′-ach-ne
Hek-or-i′-ma

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in mach-*ĭ′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Hel′-cĭ-a
Hel-dreich-ĭ-a′-nus
Hel-dreich′-ĭ-i
Hel-en′-ĭ-um
He-lĭ-ac′-zĕ-us
Hel-ĭ-am′-phor-a*
He-lĭ-anth′-em-um
he-lĭ-anth-ŏ-i′-dēs
He-lĭ-anth′-us*
He-lich′-rŏ-a
He-lich-ry′-sum
Hel-ic-o′-dĕ-a
Hel-ic-od-ic′-er-os
Hel-ic-o′-nĭ-a
hel-ic-o′-nĭ-æ-fo′-ĭ-um
hel-ic-o′-nĭ-ŏ-i′-dēs
Hel-ic-te′-rĕ-æ
Hel-ic-te′-rēs
Hel-ig′-ma
Hel′-in-us
He-lĭ-oc-ar′-pus
He-lĭ-om′-er-is
He-lĭ-oph′-il-a
He-lĭ-op′-sis
He-lĭ-oth′-rips
He-lĭ-ot-rop′-ĭ-ĕ-æ
he-lĭ-ot-rop-ĭ-ŏ-i′-dēs
He-lĭ-ot-rop′-ĭ-um
Hel-ip′-ter-um
Hel′-ix
hel-leb-or-if-ol′-ĭ-um
Hel-leb-or-i′-na
Hel-leb′-or-us*
Hel′-ler-i
Hel-ler-ĭ-a′-na
Helm-holtz′-ĭ-a
Hel′-mĭ-a
Hel-minth-os′-tach-ys
Hel-o′-nĭ-as
hel-ve′-tic-um
hel′-vol-a
Hel-wing′-ĭ-a
Hel-wing-ĭ-a′-cĕ-æ
Hel-yg′-ĭ-a
he-mer-ob-ĭ-el′-la*
He-mer-ob′-ĭ-us
He-mer-oc-al′-lĕ-æ
He′-mer-oc-al′-lis
He-mĭ-and′-ra*
He-mic-ar-pu′-rus
He-mich′-æ-na
He-mic-lĭ′-dĭ-a
He-mid-ic′-tў-um
He-mim-er-id′-ĕ-æ
He-mim′-er-is
He-mĭ-on-i′-tēs
he-mĭ-on-i-tid′-ĕ-um
He-mĭ-on-i′-tis
He-miph-rag′-ma
He-mip′-ter-a
He-mis-ac′-ris
he-mis-phæ′-ric-a
He-mis-tem′-ma
He-mit-e′-lĭ-a
Hench-man′-nĭ-i
Hen′-der-i
Hen-der-so′-nĭ-a
Hen-der-so-nĭ-a′-num
Hen-der-so′-nĭ-i
Hen-frey′-a
Hen-ri′-cĕ-a
Hen-ri′-ci
Hen-ri′-cus
Hen-rў-a′-num
Hen′-rў-i
Hen-slo-vĭ-a′-num
hep-ar-a′-na
Hep-at′-ic-a
hep-at′-ic-æ-fol′-ĭ-a
Hep′-et-is
He-pĭ-al′-id-æ
He′-pĭ-al-us
hep-taph-il′-la
Hep-tap-leu′-rum
He-rac-le-a′-na
He-rac-le-if-ol′-ĭ-a
He-rac-le′-um
her-ba′-cĕ-a
Her′-ba-rot′-a
her-ba′-rum
her′-ba-ven′-ti
Her-ber′-ti
Her-ber′-tĭ-a
Her-ber-tĭ-a′-na
Herb′-stĭ-i
Her-ĭ-ot′-ĭ-i
Her-it-e′-rĭ-a
Her-it-ĭ-e′-ra
Her-man′-ni
Her-man′-nĭ-a
Her-man′-nĭ-ĕ-æ
her-man′-nĭ-æ-fol′-ĭ-a
Her-min-ĭ-e′-ra
Her-min-ĭ-e′-ri
Her-mi′-nĭ-um
Her′-mĭ-on-e
Her-mod-ac′-tyl-on
Her-nan-de′-zĭ-i
Her-nan′-dĭ-a
her-nan-dĭ-æ-fol′-ĭ-a
her-nan-dif-ol′-ĭ-a
Her-ni-a′-rĭ-a
Her-pe′-stēs
Her-pe′-stis
Her-ra′-nĭ-a
Her-re′-rĭ-a
Herr-man′-nĭ-æ
He′-sĭ-od-a
He-si-od′-ĭ-a
Hes-per-an′-tha*
hes-per-id-if-ol′-ĭ-a
Hes-per-id′-ĭ-um
Hes′-per-is
Hes-per-oc′-lēs
Hes-per-os-cor′-don
Hes′-sĕ-a
het-er-ac-an′-tha*
He-ter-ac′-tis
het-er-an′-drum
Het-er-an-the′-ra
het-er-oc-ar′-pum
Het-er-oc-en′-tron
Het-er-oc′-er-a
Het-er-och-æ′-ta
het-er-oc′-lit-a
Het-er-od′-er-a
het′-er-od-on
het-er-od-ox′-um
het-er-og-lōs′-sa
Het-er-ol-o′-ma
het-er-om-al′-lum
Het-er-om′-el-ēs
het-er-om-or′-phum
Het-er-on′-om-a
Het-er-op-ap′-pus
Het-er-oph-leb′-ĭ-um*
het-er-oph-yl′-la
Het-er-op′-ter-a
Het-er-op′-ter-ys
Het-er-os′-path-e
Het-er-os′-tal-is
Het-er-oth-e′-ca
Het-er-ot′-om-a
Het-er-ot′-rich-um
Het-er-ot′-rop-a
Heu-che′-ra
Heuf-fel′-ĭ-i
He-ve′-a
Hew-ar′-dĭ-a
Hew-it′-tĭ-a
Hex-ac-en′-tris
hex-æ-droph′-or-us
Hex-ag-lōt′-tis
hex-ag-o′-na
hex-ag-o-nop′-ter-um
hex-ap-et′-al-um
hex-as′-tich-on
hex-or′-im-a
Hey-mas′-*sol-i*
Hey-nĕ-a′-na
hĭ′-ans
Hib-ber′-tĭ-a
hib-er′-ni-ca
Hib-is′-cus
hĭ-er-a′-cif-ol′-ĭ-a
Hĭ-er-a′-cĭ-um
Hĭ-er-och′-lŏ-e
Hĭ-er-och-un′-tin-a
hĭ-er-og-lyph′-ic-a
Hig-gin′-*sĭ*-a
Hil-air-ĭ-a′-na
Hil-deb-ran′-*dĭ*
Hil-deb-rand′-tĭ-i
Hil-lĕ-a′-num
Hil′-lĭ-a
Hil-lĭ-a′-na
Hil′-lĭ-i
hi-ma′-*lă*-ic-a
hi-ma-lay-a′-na*
Him-an-tog-lōs′-sum
Him-at-an′-thus
Hinck-sĭ-a′-nus
Hind′-sĭ-a
Hip-pĕ-as′-trum
Hip′-pĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā*′-lmist; ĕ as in sl*ĕ*n′-der; ē as in v*ē*′-ined; ĭ as in th*ĭ*n; ī as in mach-*ī*′-nist; ŏ as in r*ŏ*t′-ten; ō as in v*ō*′-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū*′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Hip′-pĭ-on
Hip-pob-ro′-mus
Hip-poc-as-tan′-ĕ-æ
Hip-poc-as′-tan-um
Hip-poc-ent-au′-rĕ-a
Hip-poc-rat-ĕ-a′-cĕ-æ
Hip-poc-re′-pis
Hip-pog-lōs′-sum
Hip-pom′-an-e
Hip-poph′-ă-e
Hip-pu′-ris
Hir-ca′-nic-um
hir-ci′-na
Hir′-cul-us
hir-su-tis′-sim-um
hir-su′-tul-a
hir-su′-tum
hir′-ta
hir-tel′-lum
hir-tif-lo′-ra
hir′-tip-ēs
his-pa′-nic-um
his′-pid-a
his-pid-is′-sim-a
his-pid′-ul-um
his-tĭ-on-anth′-a
His′-trĭ-o
his-trĭ-o′-nic-um
Hoa′-rĕ-a
Hodg-in′-sĭ-i
Hodg-so′-ni
Hodg-so′-nĭ-a
Ho-eg′-ĭ-i
Hoelt′-zer-i
Hoff-man′-nĭ-a
Hoff-man-nĭ-a′-na
Hoh-en-ber′-gĭ-a
Hoit′-zĭ-a
Hol-bœl′-lĭ-a
Holc-och-læ′-na
Hol′-cus
Hol-for-dĭ-a′-num
hol-mĭ-a′-na
Holm-ski-ol′-dĭ-a
hol-och-ry′-sum*
Hol-od-is′-cus
Hol-og-ym′-ne
Hol-ol-ach′-ne
Hol-os-chœ′-nus
hol-os-er-ic′-ĕ-um
Hol-os′-tĕ-a
Hol-ton-ĭ-a′-num
Holt′-zer-i
Hom-al-anth′-us*
Hom-al′-ĭ-ĕ-æ
Hom-al′-ĭ-um
Hom-al-om-e′-na*
Hom-al-om-y′-ĭ-a
Hom-al-on-e′-ma
Hom-e′-rĭ-a
Hom-og′-yn-e
Hom-oi-anth′-us
hom-om-al′-la
Hom-op′-ter-a
Honck-en′-ў-a
Hond-bes′-sen
Hond-en′-sis
Hood′-ĭ-a
Hoog-en-dorp′-ĭ-i
Hook′-er-a
Hook′-er-i
Hook-er-ĭ-a′-na
Hoop-es′-ĭ-i
Ho′-pĕ-a
Ho′-pĕ-i
Hop-kirk′-ĭ-a
Hop-loph′-yt-um
Hop-pe-a′-num
Hop-wood-ĭ-a′-na
Hor′-dĕ-um
hor-i′-zon-ta′-lis
Hor-kel′-ĭ-a
Hor-mi′-num
Hor′-nĕ-i
Hor-nem-an′-nĭ-a
hor′-rid-a
Hors-fall′-ĭ-i
Hors-field′-ĭ-a
Hors-field′-ĭ-i
Hors′-man-i
Hors′-man-ni
Hor-ten′-sĭ-a
hor-ten′-sis
hor-tic′-ol-a
Hos-ack′-ĭ-a
hos-mar-ĭ-en′-sis
Hos′-pit-a
Host′-a
Host′-ĕ-a
Host′-ĭ-i
Ho-teĭ′-a
hot-ten-tot-o′-rum
Hot-to′-nĭ-a
Houl-let′-ĭ-a
Houl-let-ĭ-a′-num
Houl-let′-ĭ-i
Hous-to′-nĭ-a
Hout′-tĕ-a
Hout-tĕ-a′-na
Hout-tuyn′-ĭ-a
Ho′-vĕ-a
Ho-ven′-ĭ-a
Hov-ey′-i
How-ar′-dĭ-a
How-ar′-dĭ-i
How′-ĕ-a
How-el′-lĭ-i
How-ie′-a
Hoy′-a
Hru-by-a′-num
Hud-so′-nĭ-a
Hud-so-nĭ-a′-na
Hueg-el′-ĭ-a
Hueg-el-ĭ-a′-num
Hueg-el′-ĭ-i
Hu-ern′-ĭ-a
Hug-el′-ĭ-a
Hug-el′-ĭ-i
Hugh′-ĭ-i
Hulkĕ-a′-na
Hul-let′-ti
Hul-theim′-ĭ-a
Hum-a′-ta
Hum-blo′-tĭ-i
Hum-bōldt′-ĭ-a
Hum-bōldt-ĭ-a′-na
Hum-bōldt′-ĭ-i
Hu′-mĕ-a
Hu-mĕ-a′-num
Hu′-mĕ-i
hum-if-u′-sa
hum-il-if-ol′-ĭ-a
hum′-il-is
Hu-mi′-rĭ-a
Hu-mi-rĭ-a′-cĕ-æ
Hum′-ul-us
Hun-nem-an′-nĭ-a
Hunt-ĭ-a′-num
Hunt-ley′-a
Hu′-ra
hu-ron-en′-sĕ
Hutch-in′-sĭ-a
Hut-to′-ni
hў-ac-in′-tha
Hў-ac-in-thel′-la
hў-ac-in′-thin-a
hў-ac-in′-thŏ-i′-dēs
hў-ac-in-thos′-ma
Hў-ac-in′-thus
Hy-æn-ach′-ne
hў-al′-in-a
Hў-al-op′-ter-us
Hy-ban-the′-ra
hy-ber-na′-lis
Hy-ber′-nĭ-a*
hy-ber′-nus
hyb′-rid-a
Hyd′-num
Hyd-ran′-gĕ-a*
Hyd-ran′-gĕ-æ
hyd-ran′-gĕ-æ-fol′-ĭ-a
hyd-ran′-gĕ-æ-for′-mis
hyd-ran′-gĕ-ŏ-i′-dēs
Hyd-ras′-tis
Hyd-rĭ-as-te′-le
Hyd-roc′-er-a
Hyd-roch-ar-id′-ĕ-æ
Hyd-roch′-ar-is
Hyd′-roc-leis
Hyd-roc-ot′-yl-e*
hyd-roc-ot′-yl-if-ol′-ĭ-a
Hyd-rog-lōs′-sum
Hyd-rol′-ĕ-a
Hyd-rol′-ĕ-æ
Hyd-rom-es′-tus
Hyd-rom-ys′-trĭ-a
Hyd-rop-el′-tis
Hyd-roph-yl-la′-cĕ-æ
Hyd-roph-yl′-lum
Hyd-rop-y′-rum
Hyd-ros′-tach-ys
Hyd-rot-æ′-nĭ-a
hў-em-a′-lis
Hyg-roph′-or-us
hyg-rom-et′-ric-us

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Hyl-e′-sin-us
Hy-lob′-ĭ-us
Hy-log′-yn-e
Hy-lot′-om-a
Hym-en-æ′-a*
Hym-en-an′-dra
hym-en-an′-tha
Hym-en-anth-e′-ra
Hym-en-et′-ron
Hym-en-oc-al′-lis
Hym-en-oc-ys′-tis
hym-en-o′-dēs
Hym-en-od-ic′-tĭ-on
Hym-en-o′-dĭ-um
Hym-en-ol-æ′-na
Hym-en-ol′-ep-is
hym-en-oph-yl-lŏ-i′-dēs
Hym-en-oph-yl′-lum
Hym-en-op′-ter-a
Hym-en-ost′-ach-ys
Hym-en-ox′-ys
Hy̆-oph-or′-be
Hy̆-os′-cy-am-us*
Hy-os′-path-e
Hyp-e′-cŏ-um
Hyp-e′-na
Hyp-er-anth-e′-ra*
hyp-er-bor′-ĕ-a
hyp-er-ic-if-ol′-ĭ-a
hyp-er-ic′-in-a
Hyp-er-ic-in′-ĕ-æ
hyp-er-ic-ŏ-i′-dēs
Hyp-er-ic-op′-sis
Hyp-er′-ic-um*
Hyp-er-og′-yn-e
hyph-æ-mat′-ic-um
Hyph-æ′-ne
hyp-nŏ-i′-dēs
Hyp-oc-al-ym′-ma*
Hyp-oc-al-yp′-tus
hyp-och-on′-drĭ-ac-us
hyp-oc-ra-te-rif-or′-mis
hyp-oc′-rit-a
Hyp-oc-yr′-ta
hyp-oc-yr-tif-lo′-rum
Hyp-od-em-at′-ĭ-um
Hyp-od-er′-ris
hyp-od-is′-cus
hyp-od′-yt-ēs
Hyp-o-es′-tēs
hyp-og-æ′-a
Hyp-og-æ′-i
hyp-og-lau′-ca
Hyp-og-lōs′-sum
Hyp-ol′-ep-is
hyp-ol-eu′-ca
Hyp-ol-yt′-rum
Hyp-om′-yc-ēs
Hyp-om-yc-e′-tēs
Hyp-on-om-eu′-ta
hyp-oph-yl′-la
hyp-oph-yl-lanth′-us
Hyp-op′-ith-ys
Hyp-ox-id′-ĕ-æ
Hyp-ox′-is

hyp-ox′-yl-on
hys-so-pif-ol′-ĭ-a
Hys-so′-pus
Hys-ter-ĭ-a′-cĕ-i*
Hys-ter-ĭ-on′-ic-a
Hys-ter′-ĭ-um
Hys-ter-oph′-or-us
Hys′-trix

Ĭ-anth′-a
Ĭ-anth′-e
ĭ-anth′-in-a
Ib-a′-tĭ-a
Ib-bet-so′-nĭ-a
ib-e′-ric-um
Ib-e′-rid-el′-la
ib-e′-rid-if-ol′-ĭ-a
Ib-e′-ris*
Ib-id′-ĭ-um
Ib-o′-ta
Ic-a-ci′-na
Ic-a-ci′-nĕ-æ
Ic-a′-co
Ic-ar-an′-da
Ich-no-car′-pus
Ic-i′-ca
i-cos-an′-dra
ic-ter-a′-na
Ic-to′-dēs
I-dæ′-us
I-de′-sĭ-a
I-doth′-ĕ-a
I-doth-ĕ-a′-rĭ-a
Ig-na′-ti-a
ig-nes′-cens
ig′-nĕ-um
ig-nĭ-a′-rĭ-us
I′-hur
I′-lex
i′-lic-if-ol′-ĭ-a
I-lic-in′-ĕ-æ
I′-lic-is
il-ĭ-en′-sis
Il-lai′-rĕ-a
Il-lec-eb-ra′-cĕ-æ
Il-lec′-eb-rum
Il-lic′-ĭ-um
il-lin-a′-ta
il-lin′-it-um
il-lus-tra′-ta
il-lus′-tris
il-lyr′-ic-um
il-ven′-sis
Im-ant′-oph-yl′-lum
im-ber′-be
im′-bric-ans
Im-bric-a′-rĭ-a
im-bric-a′-ta
Im-hof′-ĭ-a
im-mac-ul-a′-ta
im-mer′-sa
Im-pat′-ĭ-ens*
Im-per-a′-ti

im-per-a′-tor
Im-per-a′-tric-e
im-per-a′-trix
im-per-fol-ĭ-a′-ta
im-per-ĭ-a′-lis
im-plex′-a
im-pres′-sa
Im-ray′-i
in-æ-qua′-lĕ
in-æ-qua-lif-ol′-ĭ-a
in-æ-quil-at′-er-um
in-a-nĭ′-ta
in-ap-er′-tum
in-ca′-na
in-car-na′-ta
In-car-vil′-lĕ-a
in-cer′-tum
in-ci′-sa
in-ci-sif-ol′-ĭ-a
in-clau′-dens
in-cli-na′-ta
in-com-par-a′-bil-is
In-com-ple′-tæ
in-comp′-ta
in-con-spic′-ŭ-us
in-cur-va′-tum
in-cur′-vum
in-den-ta′-ta
in′-di-ca
In-dig-of′-er-a
in-di-vi′-sa
in-e′-brĭ-ans
in-er′-mis
in-fes′-ta
in-fes′-tans
in-fla′-ta
in-for-tu-na′-tum
in-frac′-ta
in-fun-dib′-ul-if-or′-mis
in-fun-dib′-ul-um
Ing′-a
In-gram′-ĭ-i
In-nes′-ĭ-i
In-noc-ent′-ĭ-i
I-noc-ar′-pus*
in-od-o′-ra
i-noph-yl′-la
in-or-na′-tus
in-quil-i′-nus
in′-quin-ans
in-scrip′-ta
in-sculp′-tum
In-sec′-ta
in-sig′-nis
in-sit-it′-ĭ-a
In-sleay′-i
In-stit′-ĭ-æ
in-sua′-ve
in-tac′-ta
in-teg-er′-rim-a
in′-teg-ra
in-teg-rif-ol′-ĭ-a
in-ter-jec′-ta
in-ter-med′-ĭ-um
in-ter-rup′-tum

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; y̆ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

in-ter-tex′-ta	Is-ol′-oph-us	*Jan-i′-pha*
in-tra-mar-gin-a′-lis	Is-om′-er-is	*Jank′-æ-a*
in-tri′-ca-ta	Is-on-an′-dra	*jap*-on′-ic-a
in-tror′-sum	is-op-et′-al-a	*Jar-rat′-tĭ-i*
in-tum-es′-cens	is-oph-yl′-la	Jas-ĭ-o′-ne*
in-tyb-a′-cĕ-us	Is-op-lex′-is	*Jas-min*-anth′-ēs
In′-tyb-us	Is-op′-od-a	*jas-min′-ĕ-a*
In′-ul-a	Is-op-o′-gōn	*Jas-min′-ĕ-æ*
in-ul-ŏ-i′-dēs	is-op-y′-rŏ-i′-dēs	*jas-mın*-if-lo′-ra
in-ver′-sa	Is-op-y′-rum	*jas-min*-ĭ-ŏ-i′-dēs
in-vi′-sum	*I-so′-ra*	*jas-min*-od-o′-ra*
In-vol-u-cra′-rĭ-a	Is-ot′-om-a	*jas-min*-ŏ-i′-dēs
in-vol-u-cra′-ta	Is-ot′-rop-is	*Jas′-min*-um
in-vol-u′-tum	it-al′-ic-um	*Jat-am-an′-si*
Ĭ′-o	I′-tĕ-a	Ja-tĕ-ŏ-rhi′-za
Ĭ-och-ro′-ma	i-væ-fol′-ĭ-a	Ja′-troph-a
Ĭ-o-das′-ter-um	*Iv-i′-ra*	ja-troph-æ-fol′-ĭ-um
ĭ-o-nan′-tha	*I-wa′-ra*	*Jau′-a-ri*
Ĭ-o′-ne	ix-anth-e′-rus	*jav-a-len′-sis*
ĭ-o-ne′-ma	Ix-an′-thus	*ja-van*-en′-sis
Ĭ-on-id′-ĭ-um	Ix-auch′-en-us	*ja-van* -ic-um
ĭ-on-och′-ar-is	Ix′-ĭ-a	*Jef-fer-so′-nĭ-a*
Ĭ-on-op-sid′-ĭ-um	ix′-ĭ-ŏ-i′-dēs	*Jef-fer-so′-nĭ-i*
Ĭ-on-op′-sis	Ix-ĭ-ol-i′-rĭ-on	*Jef′-frey-i*
ĭ-on-oph-thal′-mum	ix-ĭ-oph-yl′-la	*Jen-kens′-ĭ-i*
ĭ-on-op′-ter-a	Ix-o′-dēs	*Jen-kins′-ĭ-a*
ĭ-on-os′-mum	Ix-o′-dĭ-a	*Jen-kins-ĭ-a′-na*
Ĭ-os-teph′-an-e	Ix-o′-did-æ	*Jen-kins′-ĭ-i*
Ip-ec-ac-ŭ-an′-ha	Ix-on-an′-thēs	*Jen-kins-o′-ni*
I-pom-e′-rĭ-a	*Ix-o′-ra*	*Jen-kins-o′-nĭ-a*
I-pom-œ′-a		*Jen-nings-ĭ-a′-num*
I-pom-op′-sis		*Jen-nings′-ĭ-i*
Ip′-sĕ-a		*Jer-do′-nĭ-a*
ir-ap-ĕ-a′-num	*Jab-or-o′-sa*	*Jer-do′-nĭ-æ*
Ir-by-a′-na	*Jab-ot-a-pi′-ta*	*Jer-do-nĭ-a′-num*
I-res-i′-ne	*Jab-u′-ran*	*Jes′-sic-æ*
Ir-i-ar′-tĕ-a	*Jac-ar-an′-da*	*jez-ŏ*-en′-sis
I-rid′-ĕ-æ	jac-ĕ-ŏ-i′-dēs	Jo-an′-nis
i-rid-es′-cens	*Jack-ĭ-a′-na*	Joc-as′-te
i-rid-if-lo′-ra	*Jack-man′-ni*	Joh-an′-nis
i-rid-if-ol′-ĭ-a	*Jack-so′-ni*	*John′-ĭ-a*
i-rid-ĭ-ŏ-i′-dēs	*Jack-so′-nĭ-a*	*John-so′-ni*
I′-rĭ-o	Jac-ob-æ′-a	*John-sto′-ni*
I′-ris	*Jac-o-bĭ-a′-num*	*Join-vil′-lĕ-i*
ir-reg-ul-a′-rĕ	*Jac-o-bin′-ĭ-a*	*Jol-if′-fĭ-a*
ir-rig′-u-a	*Jac-quem-on′-tĭ-a*	*Jones′-ĭ-a*
ir′-ro-ra′-ta	*Jac-quem-on′-tĭ-a′-na*	*Jones-ĭ-a′-num*
Is-ab-el-li′-na	*Jac-qui′-ni*	*Jones′-ĭ-i*
Is-an′-dra	*Jac-qui′-nĭ-a*	*Jon-ghĕ-a′-na*
is-an-the′-rus	*jac-qui-nĭ-æ-fol′-ĭ-a*	*Jon′-ghĕ-ĭ*
Is-a′-rĭ-a	*Jaf-fray-a′-nus*	*Jon-quil′-la*
I′-sat-is*	*Jal-am-bi′-cĕ-a*	*jor-ul-len′-sis*
Isch′-ar-um	*Jal-ap′-a*	*Jo-se′-pha*
Isch′-nĭ-a	Jal-tom′-at-a	*Jo-se′-phi*
isch-noc′-er-us	*jam-ai-cen′-sĕ*	*Jo-se′-phĭ-a′-na*
Isch-yr-ol′-ep-is	*Jam′-bos*	*Jo-seph-i′-næ*
I-sert′-ĭ-a	*Jam-bo′-sa*	*Jo-seph-i′-nĕ-æ*
i-slan′-dic-a	*Jam-bo-sel′-la*	*Jos-ik-æ′-a*
Is-me′-lĭ-a	*Jame′-sĭ-a*	*Jov-el-la′-na*
Is-m-′-ne	*Jame-sĭ-a′-num*	*Ju′-an-ul-lo′-a*
Is-och-i′-lus	*Jame′-sĭ-i*	*Ju-a-re′-zĭ-i*
Is′-ŏ-et-ēs	*Jame-so′-ni*	Jub-æ′-a
Is-ol′-ep-is	*Jame-so′-nĭ-a*	jub-a′-ta
Is-ol-i′-næ	*Jam-ies-o′-ni*	ju-cun′-da
Is-ol-o′-ma	*jan-eir*-en′-sĕ	Ju-glan-da′-cĕ-æ

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ă*p-art′; ā as in ps*ā*′-lmist; ĕ as in sl*ĕ*n′-der; ē as in v*ē*′-ined; ĭ as in th*ĭ*n; ī as in mach-*ī*′-nist; ŏ as in r*ŏ*t′-ten; ō as in v*ō*′-ter; ŭ as in pow′-er-f*ŭ*l; ū as in r*ū*′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pa*i*n; au as *ou* in h*ou*se; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ju-glan′-dĕ-æ
ju-glan-dif-ol′-ĭ-um
Ju′-glans
jug-o′-sa
Ju′-jub-a
Ju-lĭ-a′-na
Ju-lib-rĭs′-sin
Jul-lĭ-a′-num
Ju′-lus
Jun-ca′-cĕ-æ
jun′-cĕ-a
Jun′-cĕ-æ
jun-cif-ol′-ĭ-um
jun-cif-or′-mis
Jun′-cus
Jung-er-man′-nĭ-a
Jung-huhn′-ĭ-i
ju-nip-er-a′-ta
ju-nip-er-i′-num
ju-nip-er-ŏ-i′-dēs
Ju-nip′-er-us
Ju-rĭ′-nĕ-a
Jus-sæ′-i
Jus-sĭ-æ′-a
Jus-sieu′-a
Jus-tic′-ĭ-a
juv-en′-cus

Kad-su′-ra
Kæmp′-fer-a
Kæmp′-fer-i
Kæmp-fer′-ĭ-a
Kag-en-eck′-ĭ-a
Kai′-do
Kai′-sha
Kai-et-eur′-um
Ka′-ki
Kal-an′-chŏ-e
Kal-brey′-er-i
Kal-brey′-er-ĭ-a′-na
Ka′-li
Kalm′-ĭ-a
Kalm-ĭ-a′-na
Kalm′-ĭ-i
Kal-os-anth′-ēs*
kamp-tschat′-ic-us
kam-tschat′-ic-um
Kap′-pler-i
kar-am-a′-na
Kar-a′-tas
kar-at-a′-vĕ-en′-sĕ
Kar-el-i′-ni
Kar-el-i′-nĭ-a
Kar-sten-ĭ-a′-na
Kar-sten′-ĭ-i
Kar-win-skĭ-a′-na
Kar-win′-skĭ-i
kash-mi′-rĭ-a′-na
Kath-er-i′-næ
Kat-on′-ĭ-i
Kat′-zer-i
Kauf-man-nĭ-a′-na
Kau′-ki

Kaul-fus′-sĭ-a
Kaul-fus′-sĭ-i
Kef-er-stein′-ĭ-a
Keg-el-ja′-ni
Kel-ler-man′-ni
Kel-let′-tĭ-a
Ken-drick′-ĭ-i
Ken-ned′-ў-a
Ken-ned-ў-a′-na
Kent′-ĭ-a
Kent-ĭ-op′-sis
Ken-troph-yl′-lum
Kep-pler′-ĭ-a
Ker-am-anth′-us
Ker-chov-ĕ-a′-na
Ker-chov′-ĕ-i
Ker′-ĭ-i
Ker-me-si′-na
Ker′-rĭ-a
Ker-rĭ-ŏ-i′-dēs
Kes-sel-ring′-ĭ-i
Ket-el-eer′-i
Ket-el-eer′-ĭ-a
kew-en′-sis
Keys′-ĭ-i
khas-ĭ-a′-na
khas-ў-a′-nus
khas-ў-ĭ-a′-na
Kickx′-ĭ-i
Ki-el-mey′-er-a
Ki-en-as-tĭ-a′-num
Ki-en-as′-tĭ-i
King′-ĭ-a
King-ĭ-a′-num
Kiry-an-el′-ĭ-a
Kir-il-ow′-ĭ-i
Kirk′-ĭ-i
Kit-ai-bel′-ĭ-a
Kit-ai-bel′-ĭ-i
Kit-so′-nĭ-æ
Klab-och-ĭ-a′-num
Klab-och-o′-rum
Klee′-i
Klein-hov′-ĭ-a
Klein′-ĭ-a
Klein′-ĭ-æ
Klop-stock′-ĭ-a
Klug′-ĭ-a
Knaut′-ĭ-a
Knight′-ĭ-a
Knight-ĭ-a′-na
Kniph-of′-ĭ-a
Knowl-to′-nĭ-a
Knox′-ĭ-a
Koch′-ĭ-i
Kœh′-ler-i
Kœh-ler′-ĭ-a
Koel-len-stein′-ĭ-a
Kœl-lik-er′-ĭ-a
Koel-reu-ter′-ĭ-a
Kœ′-nig-a
Kœ′-nig-i
Kok-am-ir′-ic-a
Kolb′-ĭ-i
Kol′-lar-i

Kol-om-ik′-ta
Kolp-ak-ows-ki-a′-num
Koop-man′-nĭ-i
Kop′-sĭ-a
kor-ai-a′-na
kor-ai-en′-sis
Kor-ol-kow′-i
Kor-ol-kow′-ĭ-a
Kor-sak-ow′-ĭ-i
Kor-thals′-ĭ-a
Kots-chy′-i
Kra′-mer-i
Kra-mer′-ĭ-a
Kra-mer-ĭ-a′-num
Kraus-sĭ-a′-na
Kraus′-sĭ-i
Krebs′-ĭ-i
Krel-a′-gĕ-i
Krey-sig′-ĭ-a
Kuhl′-ĭ-a
Kuhl′-ĭ-i
Kuhn′-ĭ-a
Kunth′-ĭ-a
Kunth-ĭ-a′-na
Kunz′-ĕ-a
Kunz-ĕ-a′-na
Kunz′-ĕ-i
Kunz′-ĭ-a
Kur-roo′
Kur-roo′-a
Kus-ter-ĭ-a′-na
Kyd′-ĭ-a
Kyl-ling′-a
Kyl-ling′-ĭ-a
Kyr-tan′-thus

lab-ĭ-a′-ta
Lab-ĭ-a′-tæ
Lab-i′-chĕ-a
Lab-il-lar-dĭ-e′-ra
lab-ĭ-o′-sa
Lab-is′-ĭ-a
Lab′-lab
Lab-la′-vĭ-a
Lab′-ou-che′-rĭ-a
Lab′-ou-che′-rĭ-i
lab-ro′-sus
Lab-rus′-ca
Lab-ur′-num
Lac-æ′-na
Lac-e-pe′-dĕ-a
lac′-er-ans
Lach-au′-mĕ-i
Lach-en-al′-ĭ-a
Lach-en-al′-ĭ-i
Lach-næ′-a
Lach-nanth′-ēs
lach-nŏ-i′-dēs
lach-nop-od′-ĭ-um
Lach-nos′-tom-a
Lach′-nus
lach′-rym-a
lac-il-ĭ-a′-ta

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

lac-in-ĭ-a′-tum
lac-in-ĭ-o′-sa
Lac-is-te′-ma
Lac-is-te-ma′-cĕ-æ
Lac-os′-tĕ-a
Lac-our′-ĭ-i
lac′-rym-ans
Lac-ta′-rĭ-a
Lac-ta′-rĭ-us
lac-ta′-tēs
lac-ta′-tus
lac′-te-um
lac-tic′-ol-or
lac-tif′-er-um
lac-tif-lo′-ra
Lac-tu′-ca
Lac-tu′-cæ
lac-tu-ca′-rĭ-us
lac-u-no′-sa
lac-us′-tris
la-dan-if′-er-us
La′-dan-um
Læ′-lĭ-a
Læ-lĭ-op′-sis
Læs-ta′-dĭ-a
læ-te′-vir-ens
læ′-tus
læ-vic-au′-lis
læ-vig-a′-ta
læ′-vĭ-or
læ′-vip-ēs
læ′-vis
læ-vĭ-us′-cul-us
Laf-ŏ-en′-sĭ-a
Lag-as′-ca
Lag-as′-cæ
Lag-asc′-ĕ-a
lag-e-næ-flo′-rus
Lag-e-na′-rĭ-a
Lag-e-noph′-or-a
La-ger-strö′-mĭ-a
La-get′-ta
Lag-ge′-ri
Lag-o′-pus*
lag-o′-tis
Lag-u-næ′-a
Lag-u-na′-rĭ-a
Lag-u′-rus
La-hay′-a
Laing′-ĭ-i
La′-is
Lal′-ag-e
Lal-ind′-ĕ-i
Lal-lem-ant′-ĭ-a
Lam-ar-chĕ-a′-na
Lam-arck′-ĭ-a
Lam-arck-ĭ-a′-na
Lam-arck′-ĭ-i
Lam-bert′-ĭ-a
Lam-bert-ĭ-a′-na
Lam-bert′-ĭ-i
la-mel-la′-ta
La-mel-lic-or′-nēs
La-mel-lig′-er-um
la-mel-lo′-sum
la-mĭ-if-ol′-ĭ-a
la-mĭ-ŏ-i′-dēs
La′-mĭ-um
Lam-ot′-tĕ-i
Lam-our-oux′-ĭ-a
Lam-pen′-ĭ-i
Lam-proc-oc′-cus
Lam-pro′-nĭ-a
Lam-py′-ris
La-na′-rĭ-a
la-na′-ta
lan-cas-trĭ-en′-sĕ
lan-cĕ-æ-fol′-ĭ-a
Lan-cĕ-a′-num
Lan′-cĕ-ŏ-la
lan-cĕ-ol-a′-rĭ-a
lan-cĕ-ol-a′-tus
lan′-cĕ-um
lan-cif-ol′-ĭ-um
Lan-dolph′-ĭ-a
Lane′-ĭ-i
Langs-dorf′-fĭ-a′-na
Langs-dorf′-fĭ-i
la′-nig-er
la-nig′-er-um
la′-nip-ēs
La-nip′-il-a
Lan-kes-te′-rĭ-a
Lans-berg′-ĭ-a
Lans-berg-ĭ-a′-na
Lans-berg′-ĭ-i
Lan-ta′-na
lan-ta-nif-ol′-ĭ-us
lan-ta-nŏ-i′-dēs
la-nu-gin-o′-sa
Lap-a-ge′-rĭ-a
Lap-ey-rou′-sĭ-a
lap-id′-ĕ-a
Lap-la′-cĕ-a
Lap-or′-tĕ-a
lap-pa′-cĕ-a
lap-pon′-ic-um
Lap-po′-num
Lap′-pul-a
Lar′-bre-a
Lar-diz-ab-a′-la
Lar-diz-ab-a′-lĕ-æ
lar-ic-if-ol′-ĭ-a
Lar-ic′-ĭ-o
Lar′-ic-is
Lar′-ix
Lar-pen′-tæ
Lar′-rea
la-ser-pi′-tĭ-if-ol′-ĭ-um
Las-ĭ-ag-ro′-stis
Las-ĭ-an′-dra*
las-ĭ-anth′-os
las-ĭ-oc-ar′-pus
las-ĭ-og-lōs′-sum
Las-ĭ-on-e′-ma
las-ĭ-op-et′-al-a
Las-ĭ-op-et-al′-ĕ-æ
Las-ĭ-op-et′-al-um
Las-ĭ-op′-ter-a
Las′-ĭ-op-us
las-ĭ-os′-path-a
Las-ĭ-os-per′-mum
Las-ĭ-os′-tom-a
Las-se-aux′-ĭ-i
Las-the′-nĭ-a
Las′-tre-a
la′-ta
Lat-a′-nĭ-a
lat-eb-ro′-sa
lat-er-if-lo′-ra*
lat-er-it′-ĭ-a
La-tham′-ĭ-æ
La′-thom-i
Lath-ræ′-a
lath-yr-ŏ-i′-dēs
Lath′-yr-us
la-tif-ol′-ĭ-a*
la′-tif-rons
la-tim-ac-ul-a′-tum
la′-tip-ēs
la-tis-ec′-ta
la-tis′-sim-a
La′-tŭ-a
Lauch-ĕ-a′-na
Lau-ge′-rĭ-a
Lau-re′-lĭ-a
Laur-em-berg′-ĭ-a
Laur-en-cĭ-a′-na
Laur-ent′-ĭ-a
Laur-ent′-ĭ-i
Laur′-ĕ-ol-a
laur-if-ol′-ĭ-um
laur-i′-na
Laur-i′-nĕ-æ
Lau-roc-er′-as-us
Laur′-us
Lav-al′-le-i
Lav-an′-dul-a
lav-an-dul-a′-cĕ-a
lav-an-dul-æ-fol′-ĭ-um
Lav-a′-ter-a
Lav-ra′-di-a
Law-ren-cĕ-a′-na
Law-so′-nĭ-a
Law-so-nĭ-a′-na
lax-if-lo′-ra
lax-if-ol′-ĭ-a
Lax-man′-nĭ-a
lax′-us
Lay′-ĭ-a
Laz-u′-li
Leach-ĭ-a′-num
Lear′-ĭ-i
Leav-en-worth′-ĭ-a
Leb′-bek
Leb-eck′-ĕ-a
Leb-ret-o′-nĭ-a
Lec-an-i′-næ
Lec-an′-ĭ-um
Lec-an-op′-ter-is
Lec-an-o′-ra
Lech-en-aul′-tĭ-a
Lech-le′-ra
Lec-on′-tĕ-i
Lec-on′-tĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Le′-cyth-æ
Le-cyth′-ĕ-a
Le-cyth-id′-ĕ-æ
Le′-cyth-is*
Led-eb-our′-ĭ-a
*Led-eb-our-*ĭ-a′-na
Led-eb-our′-ĭ-ĭ
Led-en-berg′-ĭ-a
*Ledg-er-*ĭ-a′-na
le-dif-ol′-ĭ-a
Le-doc-ar′-pum
Le′-dum
Lee′-a
Lee-a′-na
*Leech-*ĭ-a′-num
Leeds′-ĭ-i
Leg-ouz′-ĭ-a
Leg-rand′-ĭ
Leg-rel′-læ
*Leg-rel-*lĭ-a′-na
Leg-uay-a′-na
Leg-u-min-o′-sæ
Leh-man′-ni
lei-anth-e′-rum
Lei-anth′-us
Lei-bold′-ĭ-i
Leich-ardt′-ĭ-a
*Leich-ardt-*ĭ-a′-na
*Leich-ten-stein-*ĭ-a′-na
Leicht′-lin-i
Leicht-lin′-ĭ-i
Leim-anth′-ĭ-um
lei-oc-ar′-pus
Lei-oc-ar′-ŷ-a
Lei-och-i′-lus
Lei-oph-yl′-lum
lei-orh-i′-zon
Lei-os-per′-mum
Lei-ot′-ul-us
Lei-phai′-mos
Leit-ne′-rĭ-a
*Leit-ne′-*rĭ-ĕ-æ
Leitz′-ĭ-a
Le′-jic-a
Le′-ma
*Lem-ai-rĕ-*a′-num
Lem-bot-rop′-is
*Lem-min′-ghĕ-*ĭ
Lem′-na
Lem-na′-cĕ-æ
Lem-oi′-nĕ-i
*Lem-oin-*ĭ-*e′*-rĭ-i
Le-mo′-nĭ-a*
*Lem-on-*ĭ-a′-na
len-dig′-er-a
*Len-dy-*a′-nus
Lens
len′-ta
Len-ta′-go
Len-tib-ul-a′-rĭ-ĕ-æ
len-tic-ul-a′-ris
len-ti′-gin-is
len-ti-gin-o′-sum
len-tis-cif-ol′-ĭ-a
Len-tis′-cus

le-o-nen′-sis
Lĕ-o-no′-tis*
Lĕ-on-tic′-e
Lĕ-on′-tod-on
lĕ-on-tog-lōs′-sa
Lĕ-on-top-od′-ĭ-um
lĕ-o-nu-rŏ-i′-dēs
Lĕ-o-nu′-rus
Lĕ-op-ar-danth′-us
lĕ-op-ar-di′-num
Le-op-ōl′-di
Le-op-ōl-di′-nĭ-a
Lep′-ach-ys
Lep-anth′-ēs
Lep-anth′-us
Lep-ech-i′-nĭ-a
Lep-er-i′-za
Lep-ic-ys′-tis
lep′-id-a
Lep-id-ag′-ath-is*
Lep-id′-ĭ-i
Lep-id′-ĭ-um
lep-id-oc-ar′-pon
Lep-id-oc-ar′-ŷ-a
lep-id-oc-au′-ion
Lep-id-op-el′-ma
lep-id-oph-yl′-la
Lep-id-op′-ter-a
lep-id-op′-ter-is
lep-id-o′-ta
lep′-id-us
Lep-ĭ-o′-ta
Lep-is′-mĭ-um
lep-ro′-sa
Lep-tan′-dra
Lep-tar-gyr-ei′-a
Lep-tin-el′-la
Lep-toc-ar′-pus
lep-toc-au′-lis
Lep-toc′-er-as
Lep-toch-i′-lus
Lep-toc-ĭ-on′-ĭ-um
lep-toc′-lad-a
Lep-tod-ac′-tyl-on
Lep-tod-er′-mis
Lep-tog-lōt′-tis
Lep-tog-ram′-me
Lep-tog′-yn-e
lep-tol′-ep-is
Lep-tom-er′-ĭ-a
lep-toph-yl′-la
Lep-top-leu′-rĭ-a
Lep-top′-ter-is
lep′-top-us
Lep-top-y′-rum
lep-tos-ep′-al-a
Lep-tos′-iph-ôn
lep-tos-pa′-dix
Lep-tos-per′-mum
Lep-tos-tach′-ŷ-a
Lep-tos-tig′-ma
Lep-tos′-yn-e
Lep′-tot-ēs
Lep′-toth-rix
Lep-toth-yr′-ĭ-um

Lep′-tus
Les-chen-ault′-ĭ-a
*Les-chen-ault-*ĭ-a′-na
Les-chen-ault′-ĭ-i
Les-pe-de′-za
Les-sert′-ĭ-a
*les-sert-*ĭ-if-ol′-ĭ-a
Les-so′-nĭ-i
Lett-som′-ĭ-a
Leu-cad-en′-dron
leu-canth′-a
leu-canth-em-if-ol′-ĭ-a
Leu-canth′-em-um
Leuch-ten-berg′-ĭ-a
leu-cob′-ot-rys
Leu-coc-ar′-pus
leu-coc-eph′-al-us
leu-coch-i′-lum
Leu-coc-or′-yn-e
Leu-cŏ-hy′-le
Leu′-cŏ-ĭ-um
Leu-col-æ′-na
leu-con-eu′-ra
leu-coph-æ′-a
leu-coph-æ-a′-rĭ-a
leu-coph-æ′-rĭ-a
leu-coph-thal′-mus
Leu-coph-yl′-lĕ-æ
leu-coph-yl′-lum
Leu-cop-o′-gōn
leu-cop-y′-rus
leu-corh-i′-za
leu-corh′-od-a
Leu-cos-per′-mum
leu-cos′-tach-ys
Leu-cos-teg′-ĭ-a
leu-cos′-tom-um
Leu-coth′-ŏ-e
leu-cox-anth′-a
leu-cox′-yl-a
Leuz′-ĕ-a
*Leuz-ĕ-*a′-num
Lev-en-hook′-ĭ-a
Lev-is′-tic-um
Lew-is′-ĭ-a
*Lew-is-*ĭ-a′-nus
Lew-is′-ĭ-i
Lex-ar′-sa
Leyces-te′-rĭ-a
Ley′-i
Leys′-ser-a
*L'He-rit-*ĭ-*e′*-ri
*L'Her-min-*ĭ-*e′*-ri
Lhotz′-kŷ-a
Lĭ-a′-bum
Li-a′-tris
lib-an-en′-sis
Lib′-an-i
lib-an-o′-tic-us
Lib-an-o′-tis
lib-e′-ric-a
Lib-ert′-ĭ-a
Lib-oc-ed′-rus
Li-bo′-nĭ-a
*Li-bo-nĭ-*a′-na

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

lib-ur′-nic-us
Li-che′-nēs
Lich-ten-stein′-ĭ-a
Lic-u-a′-la
Lie-big′-ĭ-a
Lieb-man-nĭ-a′-num
Li-er-val′-ĭ-i
Li-etz′-ĕ-i
Li-etz′-ĭ-a
Li-ev-e′-na
Lig-e′-rĭ-a
Light-foot′-ĭ-a
lig-nip-er′-da
lig-no′-sus
Lig′-tu
lig-ul-a′-re
Lig-ul-a′-rĭ-a
Lig-us′-tic-i
Lig-us′-tic-um
Lig-us′-tri
lig-us-trif-ol′-ĭ-a
Lig-us-tri′-na
Lig-us′-trum
li-la-cin-el′-la
li-la′-cin-us
Li-la′-cis
Li-lĭ-a′-cĕ-æ
Li-lĭ-a′-go
Li-lĭ-as′-trum
li-lĭ-if-lo′-ra
Li′-lĭ-um*
li-ma-ci′-na
li-ma′-cis
Li-mat-o′-dēs
Li′-max
lim-ba′-tum
Li-met′-ta
Li′-mĭ-a
Lim-mingh′-ĕ-i
Lim-nanth′-ĕ-æ
Lim-nanth′-em-um
Lim-nanth′-ēs
Lim-ne′-tis
Lim-nob′-ĭ-um
Lim-noch′-ar-is
Lim-non-e′-sis
Li-mod-o′-rum
Li-mo′-nĭ-a
Li-mo-nĭ-as′-trum
li-mo-nĭ-if-ol′-ĭ-um
Li-mo′-num
li-mo′-sa
Li′-na
Li-na′-rĭ-a
li-na-rĭ-æ-fol′-ĭ-a
li-na-rif-ol′-ĭ-us
Lin-aw-ĭ-a′-num
Lin-co′-nĭ-a
Lin-del-of′-ĭ-a
Lin′-den-i
Lin-den′-ĭ-a
Lin-den-ĭ-a′-na
Lin-de′-ra
Lind-heim′-er-a
Lind-heim′-er-i
Lin′-dig-i
Lind′-ley-a
Lind-ley-a′-num
Lind′-ley-i
Lind-sæ′-a
Lind-say′-a
Li′-nĕ-æ
li-nĕ-a′-re
li-nĕ-a-rif-ol′-ĭ-a
li-nĕ-a-ril′-ob-a
li-nĕ-at-el′-la
li-nĕ-a′-tus
Lin′-gua
lin-guæ-fol′-ĭ-a
lin-guæ-for′-me
lin-guel′-la
lin-guif-or′-me
lin-gul-a′-ta
li-nif′-er-a
li-nif-ol′-ĭ-us
Link′-ĭ-a
Lin-næ′-a
Lin-næ-a′-na
Lin-næ′-i
lin-næ-ŏ-ĭ′-dēs
li-nŏ-ĭ′-dēs
li-noph-yl′-la
Li-nos′-yr-is
lin-tĕ-a′-rĭ-a
Li′-num
Li-nyph′-ĭ-a
Li-par′-ĭ-a
Li-poch-æ′-te
Lip′-ar-is
Lip-os′-tom-a
Lip′-pĭ-a
Liq-uid-am′-bar
Liq-uir-i′-tĭ-a
Li-rĭ-od-en′-dron
Li′-rĭ-op-e
Lis-ĭ-anth′-us
Lis-santh′-e
Lis-soch-i′-lus
Lis′-ter-a
Lis-tros′-tach-ys
Lis-ŷ-anth′-us
Li′-ta
Li-tanth′-us
Lit′-chi
Lith-oc-ol-le′-tis
lith-os-per-mŏ-i′-dēs
Lith-os-per′-mum
Lith-ræ′-a
Li-tob-roch′-ĭ-a
Lit-se′-a
Lit-tæ′-a
Lit-ton′-ĭ-a
lit-tor-a′-lis
lit-tor′-ĕ-a
Lit-tor-el′-la
lit-u-if-lo′-rum
lit′-um
li′-vid-us
Liv-ing-sto-nĕ-a′-na
Liv-ing-sto′-nĭ-i
Liv-is-to′-na
Lla′-ve-a
Lloyd′-ĭ-a
Lo-a′-sa
Lo-a′-sĕ-æ
lob-a′-ta
Lob-bĭ-a′-nus
Lob′-bĭ-i
Lo-be′-lĭ-a
Lo-be-lĭ-a′-cĕ-æ
Lo-be-lĭ-a′-num
Lo-be′-lĭ-i
lo-be-lĭ-ŏ-ĭ′-dēs
Lo-bel′-lĭ-i
Lob-e′-sĭ-a
Lob-os-te′-mōn
lob-ul-a′-ris
Loch-e′-rĭ-a
Lock-hart′-ĭ-a
Lod-dig-e′-sĭ-a
Lod-dig-e-sĭ-a′-num
Lod-dig-e′-sĭ-i
Lod-ŏ-ĭ′-cĕ-a
Loef-fling′-ĭ-i
Læs-e′-li
Læs-e′-lĭ-a
Log-an′-ĭ-a
Log-an-ĭ-a′-cĕ-æ
Lois-el-eur′-ĭ-a
Lois-el′-li
lol-ĭ-a′-cĕ-us
Lol′-ĭ-um
Lo-mag-ram′-me*
Lo-man′-dra
Lo-ma′-rĭ-a
Lo-ma-rid′-ĭ-um
Lo-ma-rĭ-op′-sis
Lo-ma′-tĭ-a
Lo-mat-og-on′-ĭ-um
Lo-mat-oph-yl′-lum
Lo′-nas
lonch-it-id′-ĕ-a
Lonch-i′-tis
Lonch-oc-ar′-pus
Londes-bor-ough-ĭ-a′-num
lon′-ga
lon-gæ′-va
Lon-ga′-na
Long-champ′-ĭ-a
long-eb-rac-tĕ-a′-tum
long-ep-ed-un-cul-a′-ta
long-er-ac-em-o′-sum
long-ib-rac-tĕ-a′-ta
long-ic-aud-a′-ta
long-ic-ol′-la
Long-ic-or′-nĭ-a
long-ic-or′-nu
long-ic-ru′-ris
long-ic-us′-pis
long-if-i′-lis
long-if-lo′-ra
long-if-ol′-ĭ-a
long-ĭ-ha-ma′-ta
long-il-a′-min-a′-tum
long-il′-ob-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

long-im-u-cro-na′-ta
long′-ip-ēs
long-ip-et′-al-a
long-ip′-il-a
long-ip-in-na′-ta
long-ir-ac-e-mo′-sa
long-ir-os′-tris
long-is-ca′-pa
long-is′-path-a
long-is-pi′-nus
long-is′-sim-a
long-is′-tyl-um
long′-us
Lon-ic-e′-ra
lon-ic-e-rŏ-i′-dēs
Lop-ad-oc′-al-yx
Lop-e′-zĭ-a
Loph-anth′-us*
Loph-id′-ĭ-um
Loph′-ĭ-ol-a
Loph-ĭ-os-tom-a′-cĕ-i
Loph-i′-ra
Loph-oc-li′-nĭ-um
Loph-ol′-ep-is
Loph-os-o′-rus
Loph-os-per′-mum
Loph-y′-rus
Lop-im′-ĭ-a
Lo-ranth-a′-cĕ-æ
Lo-ranth′-us*
Lor-ent′-ĕ-a
Lor-enz-ĭ-a′-na
Lor-ey′-a
Lor-ey′-i
lo-ri′-cĕ-um
lo-rif-ol′-ĭ-us
Lor-in-se′-rĭ-a
Lo-rop-et′-al-um
lo-tif-ol′-ĭ-a
Lo′-tus
Lot′-zĕ-a
Lou′-don-i
Lou-don-ĭ-a′-na
Lou-don′-ĭ-i
Lou-et′-ti
Lour-eir′-i
Louv-rex-ĭ-a′-num
Low′-ĕ-a
Low′-ĕ-i
Low-ĭ-a′-num
Low′-ĭ-i
Lox-anth′-ēs
Lox-anth′-us
lox-en′-sis
Lox-oc-oc′-cus
Lox-os′-caph-e
Lox-o′-tis
Lox-so′-ma
Loz-ot-æ′-nĭ-a
Lub-bers-ĭ-a′-na
Lu-bin′-ĭ-a
lu-bric-ip′-ed-a
Lu′-ca-nus
Lu-ci-a′-ni
lu′-cid-um
lu-cif′-ug-us
Lu-ci′-li-æ
Lu-ci′-næ-a
lu-co′-rum
Lu-cu′-lĭ-a
Lu-cu′-lĭ-æ
Lu-cu′-ma
Lu-cum′-bĕ-a′-na
Lu-cy-a′-nus
Lud-dem-an′-nĭ-a
Lud-dem-an-nĭ-a′-num
Lud-dem-an′-nĭ-i
Lu′-dĭ-a
lu-dib-un′-da
Lu-di′-sĭ-a
Lu-dov′-ĭ-a
lu-dov-ic-ĭ-a′-na
Lud-wig-ĭ-a′-na
Luf′-fa
lug-du-nen′-sis
Lu′-he-a
Lu-i′-sĭ-a
Lu′-ma
Lum-bri′-cus
Lu′-na
Lu-na′-rĭ-a
lu-na-rif-ol′-ĭ-a
lu-na′-ris
lu-na-rŏ-i′-dēs
lu-na′-ta
lu-nif′-er-a
lu-nul-a′-ta
lup-ic-i′-dum
Lup-i-nas′-ter
lup-i-nif-ol′-ĭ-a
lup-i-nŏ-i′-dēs
Lup-i′-nus
lup-ul-i′-na
Lup′-ul-us
lu′-rid-a
Lusch-nath-ĭ-a′-num
Lusch-nat-ĭ-a′-num
lu-sit-a′-nic-us
Lus-sa′-cĭ-a
lu′-tĕ-a
lu′-tĕ-ol-um
lu-tes′-cens
lu-te-tĭ-a′-na
lux-a′-tum
Lux-em-berg′-ĭ-a
lux-ur′-ĭ-ans
Lu′-zul-a
Luz-u-rĭ-a′-ga
Ly-all′-ĭ-i
Lyc-as′-te
Lych′-is
lych-nid′-ĕ-a
Lych′-nis
lych-ni′-tis
lyc′-ĭ-a
Lyc-im′-nĭ-a
lyc-ĭ-ŏ-i′-dēs
Lyc-ĭ-op-le′-sĭ-um
Lyc′-ĭ-um
lyc-oc′-ton-um
Lyc-op-er′-don
Lyc-op-er′-sic-um
Lyc-op-od-ĭ-a′-cĕ-æ
Lyc-op-od′-ĭ-ĕ-æ
lyc-op-od-ĭ-ŏ-i′-dēs
Lyc-op-od′-ĭ-um*
lyc-op′-sod-is
Lyc-o′-ris
Lyc-o′-sa
Ly′-da
ly′-dĭ-um
Ly-el′-li
Lyg-is′-tum
Lyg-od-ic′-tŷ-on
Lyg-o′-dĭ-um
Lyg′-us
Lyn-ce′-a
Lynch-ĭ-a′-na
Ly′-on-i
Ly-on′-ĭ-a
Ly-on′-si
Ly-on′-sĭ-a
Ly-pe′-rĭ-a
lyr-a′-ta
lyr-og-lōs′-sum
Lys-anth′-e
Ly-sim-ach′-ĭ-a
Ly-sin-e′-ma
Lys-ĭ-on-o′-tus
Lys-is-tig′-ma
Lyth-ra′-rĭ-ĕ-æ
Lyth′-rum
Lyt′-ta

Ma-ack′-ĭ-a
Ma-ack′-ĭ-i
Ma′-ba
Mac-ad-am′-ĭ-a
Mac-af-ee-a′-na
Mac-arth-ur′-ĭ-i
Mac-Carth′-ĭ-æ
Mac-don-ald′-ĭ-a
Mac-don-ald′-ĭ-æ
Mac-far′-lane-i
Mac-fee-a′-na
Mach-ær-anth-e′-ra
Mach-ær′-ĭ-um
mac-il-en′-ta
Mac-kai-a′-na
Mac-kay′-a
Mac-kay-a′-nus
Mac-kay′-i
Mac-ken′-ĭ-i
Mac-ken′-zĭ-i
Mac-lea′-i
Mac-lean′-a
Mac-lean′-ĭ-a
Mac-leay′-a
Mac-leay′-i
Mac-lu′-ra
Mac-nab-ĭ-a′-na
Mac-o′-dēs
Mac-ow′-an-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *aĭ* in pa*ĭn*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Māc′-qui
mac-rac-an′-tha
Mac-rad-e′-nĭ-a
mac-rad-e′-num
Mac-ræ′-a
Mac-ræ′-i
mac-ran′-dra
Mac-ran-op′-lon
Mac-ranth′-us
mac-rob′-ot-rys
mac-roc-al′-yx
mac-roc-ar′-pa
mac-roc-eph′-al-a
Mac-roc-er-at-i′-dēs
mac-roch-i′-lum
Mac-roch′-lŏ-a
Mac-roc′-lad-us
Mac-roc-ne′-mum*
mac-rod-ac′-tyl-a
mac′-rod-on
mac-rod-on′-ta
Mac-rog-lōs′-sa
Mac-rol-ep-id-op′-ter-a
Mac-rol-ob′-ĭ-um
mac-rol′-ob-um
Mac-rom-er′-ĭ-a
mac-rop-et′-al-a
mac-roph-yl′-lum
Mac-rop′-ip-er
mac-rop-lec′-tron
Mac-rop-le′-thus
mac-rop′-od-a
mac-rop′-ter-a
mac′-rop-us
mac-rorh-i′-zon
Mac-rorh-yn′-chus
Mac-ros′-iph-ōn
mac-ros-pa′-dix
mac-ros-pei′-la
Mac-ros-por′-ĭ-um
mac-ros′-por-um
mac-ros-tach′-ў-a
mac-ros′-tach-ys
mac-ros-teg′-ĭ-a
mac-ros-te′-ma
mac-ros-teph′-an-a
Mac-ros-tig′-ma
mac-ros′-tyl-a
Mac-ros′-tyl-is
mac-roth-yr′-sa
mac-ro′-tis
Mac-rot′-rop-is
mac-rou′-ra
Mac-roz-a′-mĭ-a
mac-ru′-ra
mac-ul-a′-tus
mac-ul-o′-sa
mad-ag-as-car-ĭ-en′-sis
Ma-da′-rĭ-a
Mad-ar-og-lōs′-sa
Mad′-den-i
Mad-dis-on-ĭ-a′-na
mad-e-ren′-sis
Ma′-di-a
Mad-on′-na
mad-ras-pat-a′-na
mad-ren′-sĕ
Mœ′-ru-a
Mœ′-sa
mæ′-sĭ-ac-us
Mag-dal-e′-nus
mag-el-lan′-ic-us
mag′-ic-um
Mag′-lĭ-a
Mag-nic-or-o-na′-ti
mag-nif′-ic-us
Mag-no′-lĭ-a
Mag-no-lĭ-a′-cĕ-æ
mag-no-lĭ-æ-fol′-ĭ-um
Mah-ag-o′-ni
Mah′-al-eb
Ma-har-ang′-a
Ma-her′-nĭ-a
Ma-ho′-nĭ-a
Ma-hu′-rĕ-a
Ma′-i
Mai-anth′-em-um
ma-id-if-ol′-ĭ-a
Main′-ĕ-a
Mair′-ĭ-a
ma-ja′-lis
ma-jes′-tic-a
ma′-jor
Maj-or-a′-na
maj-or-a-nŏ-i′-dēs
ma′-jus
Ma′-ki
Mak-oy′-a
Mak-oy-a′-na
Mal-ab-ai′-la
mal-ab-a′-ric-a
mal-a-bath′-ric-a
Ma-lab-ath′-rum
Mal-ach-ad-e′-nĭ-a
Mal-ach′-ĭ-um
Mal-ach-od-en′-dron
Mal-ach′-ra
Mal-ac-oc-ar′-pus
mal-ac-ŏ-i′-dēs
mal-ai-a′-na
Mal-ax′-is
ma-lay-a′-num
Mal-col′-mĭ-a
mal′-ĕ-ol-ens*
Mal-es-herb′-ĭ-ĕ-æ
Ma′-li*
ma-lif-or′-mis
mal-lĕ-if′-er-a
Mal-loc-oc′-ca
Ma′-lop-e
Mal-or-ti′-ĕ-a
Mal-or-ti-ĕ-a′-nus
Mal-pi′-ghĭ-a
Mal-pi-ghĭ-a′-cĕ-æ
Ma′-lus
Mal′-va
Mal-va′-cĕ-æ
Mal-va-cĕ-a′-rum
mal-va′-cĕ-um
Mal-vas′-trum
Mal-vav-is′-cus
Ma′-lў-i
Mal-zi′-nĕ-i
Ma′-mĕ-i
Mam-es′-tra
Mam-il-la′-rĭ-a
Mam′-me-a
Mam-mil-la′-rĭ-a
mam-mo′-sa
Man-cin-el′-la
Man-dev-il′-la
Man-dĭ-oc′-ca
man-dĭ-oc-ca′-na
Man-drag′-or-a
mand-schu′-ric-us
Man-es-ca′-vi
Man-et′-tĭ-a
man-et-tĭ-æ-flo′-rus
Mang′-has
Mang-if′-er-a
Mang′-le
Mang-les′-ĭ-a
Mang-les′-ĭ-i
Mang-lil′-la
Mang′-or-a
Mang-os-ta′-na
Man-ic-a′-rĭ-a
man-ic-a′-ta
Man′-i-hot
Man-li′-lĭ-a
Man′-nĭ-i
Man-tis′-ĭ-a
Man-ul′-ŏ-a
Man-ul-ĕ-ie′-æ
Ma-on-et′-ti
Ma′-pa
Map′-pa
Mar-a′-ja
Ma′-ram
Mar-an′-ta
Mar-an′-tæ
mar-an-tæ-fol′-ĭ-um
Mar-an′-tĕ-æ
Mar-anth′-ēs
Mar-as′-mĭ-us
Mar-at′-tĭ-a
Mar-at′-tĭ-ĕ-æ
Marc-grav′-ĭ-ĕ-æ
March′-ĭ-i
Mar-ci-a′-nus
mar-gar-i-ta′-cĕ-um
mar-gar-i-tif′-er-a
mar-gin-a′-lis
mar-gin-a′-ta
mar-gin-el′-la
mar′-gin-em-tor′-quens
Mar-gyr-ic-ar′-pus
Mar-ĭ′-æ
Mar-i′-æ-Reg-i′-næ
Mar-ĭ-al′-va
Mar-i-a′-næ
Ma-rĭ-anth′-us
Mar-i-a′-num
Ma′-ric-a
Ma-ries′-ĭ-i

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ma′-ril-a
ma-ri-land′-ic-a
mar-i′-na
mar-it′-im-a
Mar′-lĕ-a
Mar-me′-los
mar-mor-a′-ta
mar-mor′-ĕ-a
mar-mor-oph-yl′-lum
Mar-nock-ĭ-a′-na
mar-oc-ca′-na
mar-o-ni-en′-sĕ
Mar-ri-ot-tĭ-a′-na
Mar-rub-ĭ-as′-trum
Mar-rub′-ĭ-um
Mar-ry-at′-tæ
Mar-schal-lĭ-a′-na
Mars-den′-ĭ-a
Mar-shal′-lĭ-a
Mar-shal′-lĭ-æ
Mar-shal-lĭ-a′-num
Mar-shal′-lĭ-i
Mar-si′-lĕ-a
Mar-si′-lĕ-æ
Mar-su′-pĭ-um
Mar′-tag-on
Mar-tens′-ĭ-i
Mar-tĭ-a′-na
Mar′-tĭ-i
Mar-ti-ne′-zĭ-a
Mar-ti′-ni
mar-tin-i-cen′-sis
Mar-tin-i-e′-rĭ-a
Mar-tyn′-ĭ-a
Ma′-ru
Mar′-um
Mar-u′-mĭ-a
ma-ry-land′-ic-a
mas
Mas-car-en-ha′-sĭ-a
mas′-cul-a
mas-cul-a′-ta
Mas-dev-al′-lĭ-a
Mas-sal-ong-ĭ-a′-num
Mas-san′-gĕ-a
Mas-san-gĕ-a′-na
Mas-san′-gĕ-i
Mas-so′-ni
Mas-so′-nĭ-a
Mas-so-nĭ-a′-na
Mas-so′-vĭ-a
Mas-tac-anth′-us
Mas-ters-ĭ-a′-na
Mas-ters′-ĭ-i
Mas-u′-ca
Mat-ax′-a
Math′-ĕ-a
Math′-ĕ-ol-a
Math-o-tĭ-a′-na
Mat-o′-nĭ-a
Mat-ou′-re-a
Ma-tri-ca′-rĭ-a
ma-tro-na′-lis
Mat-thews′-ĭ-i
Mat-thi′-ol-i
Mat-this-o′-nĭ-a
Mat-tuschk′-ĭ-a
ma-tu-ti′-na
Mau′-gĕ-i
Mau′-lĕ-i
mau′-ra
Mau-ran′-dy-a
Mau′-rĕ-a
mau-ri-ta′-nic-a
Mau-rit′-ĭ-a
mau-rit-ĭ-æ-for′-mis
mau-rit-ĭ-a′-nus
Mau-roc-e′-nĭ-a
mau-ro′-rum
Maw-e-a′-na
Maw′-ĭ-i
max-il-la′-rĕ
Max-il-la′-rĭ-a
max′-im-a
Max-im-il-ĭ-a′-na
Max-im-il-ĭ-a′-ni
Max-im-ow-ic′-zĭ-a
Max-im-ow-ic′-zĭ-i
May-a′-ca
May-a′-cĕ-æ
May-a′-na
Mayr′-i
Ma′-ys
May′-ten-us
Maz′-el-i
Maz-el′-lĭ-i
Maz′-us
Mead′-ĭ-a
Me-co-nop′-sis*
Me-cos-o′-rus
Me-de′-ol-a
Me′-dic-a*
Me-dic-a′-go
Med-i′-cĭ-a*
Me-din-il′-la
Med-ĭ-oc-or-o-na′-ti
med-it-er-ra′-nĕ-us
med′-ĭ-um
med-ol-ŏ-i′-dēs
Med-o′-ra
med-ul-la′-ris
Med-u′-sæ
Meg-ac-ar-pæ′-a
Meg-ac-ar′-pha
meg-ac′-er-as
Meg-ach-i′-le
Meg-ac-lĭ′-nĭ-um
meg-al-anth′-a
meg-al′-od-us
Meg-al-oth-e′-ca
meg-aph-yl′-la
meg-ap-ot-am′-ic-us*
Meg-ar-rhi′-za
Meg-as′-ĕ-a
meg-as-per′-ma
meg-as-tach′-ŷ-a
meg-as-tig′-ma
me-if-ol′-ĭ-um
Meir-ac-yl′-ĭ-um
meir′-ax
Mel-al-eu′-ca*
Mel-amp′-sor-a
Mel-am-py′-rum
mel-an-anth′-um
mel-an-a′-rĭ-us
mel-an-chol′-ic-us
Mel-an′-drĭ-um
Mel-an-oc-ar′-pum
mel-an-oc-au′-lon
mel-an-och-æ′-tēs
mel-an-och-ry′-sum
mel-an-oc-oc′-ca
mel-an-ol-eu′-ca
mel-an-op-et′-al-um
mel-an-oph-thal′-mum
mel′-an-ōps
Mel-an-op′-ter-is
mel-an′-op-us
mel-an-orh′-od-a*
Mel-an-or-rhœ′-a
Mel-an-os-el-i′-num
mel-an-ox-anth′-a
mel-an-ox′-yl-on
Mel-anth-a′-cĕ-æ
Mel-anth-e′-ra
Mel-anth′-ĭ-um
Mel-arh-i′-za
Mel-as′-ma
Mel-as-phæ′-rul-a
Mel-as′-tom-a
Mel-as-tom-a′-cĕ-æ
Mel-ĕ-a′-gris
mel-ĕ-a′-grŏ-i′-dēs
Mel-eg-ue′-ta
Mel-han′-ĭ-a
Mel′-ĭ-a
Mel-ĭ-a′-cĕ-æ
Mel-ĭ-anth′-ĕ-æ
Mel-ĭ-anth′-us
Mel-ich′-rus
Mel-ic-oc′-ca
Mel-ic′-op-e
mel-il-o-tŏ-i′-dēs
Mel-il-o′-tus*
Mel-in′-dres
Mel-in-o′-ni
Me′-lin-um
Mel-ĭ-os′-ma
mel-ĭ-o′-sum
Mel-is′-sa
mel-is-sæ-fol′-ĭ-a
mel-is-sŏ-i′-dēs
Mel-is-soph-yl′-lum
mel-it-tif-ol′-ĭ-a
Mel-it′-tis
mel′-lĕ-us
mel-lif′-er-a
mel-lif′-ic-a
Mel′-loc-a
Me′-lo*
Me-loc-ac′-tus
mel-oc′-ton-um
Me-lod-i′-nus
me-lof-or′-mis
Mel-ol-onth′-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Me-long′-en-a
Mel-vil′-la
mem-bra-na′-cĕ-um
mem-bra-nif-ol′-ĭ-um
Me-me-cyl′-ĕ-æ
Me-me′-cyl-on
Mem-phi′-tic-a
Men-de′-lĭ-i
Men-del′-li
men-di′-ca
Me-nin′-ĭ-a
me-nis-cĭ-if-ol′-ĭ-um
me-nis-cĭ-ŏ-i′-dēs
Me-nis′-cĭ-um
Me-nis-per-ma′-cĕ-æ
Me-nis-per′-mum*
Men′-tha
Men′-thæ
men-thæ-fol′-ĭ-a
Men-thas′-tri
men′-tĭ-ens
Ment-ze′-lĭ-a
Me-nў-anth′-ēs
Men-zies′-ĭ-a
Men-zies-ĭ-a′-na
Men-zies′-ĭ-i
Merck′-i
Mer-cur-ĭ-a′-lis
mer-dig′-er-a
Mer-en-de′-ra
Me-ri-a′-na
Me-ri-a′-næ
Me-ri-a′-nĭ-a
Me-ris-tos-tig′-ma
Mer′-od-on
Mer-ten′-sĭ-a
Mer-ten-sĭ-a′-na
Mer-ul′-ĭ-us
Mer′-yt-a
Mes-ēm′-brў-anth-em′-ĕ-æ
mes-ēm-brў-anth′-em-ŏ-i′-dēs
Mes-ēm-brў-anth′-em-um*
Mes-ēm′-brў-ĕ-æ
Mes-och-læ′-na
mes-och′-lŏ-a
Mes-oc-las′-tēs
mes-ol-eu′-cum
Mes-os-pi-nid′-ĭ-um
mes-pil-ŏ-i′-dēs
Mes′-pil-us
Mes-ser-schmi i′-ĭ-a
Me′-su-a
Met′-ak-e
met-al′-lic-a
Met-ax′-ў-a
Me′-tel
me-tel-ŏ-i′-dēs
Meth-on′-ic-a
Me-trod-o′-rĕ-a
Me-tros-id-e′-ros
Me-trox′-yl-on
Met-ter-nich′-ĭ-a
Met-ter-nich′-ĭ-i
me-tul-æ-flo′-ra
me-tul-if′-er-us

Me′-um
mex-ic-a′-na
Mey-en′-ĭ-a
Mey′-er-i
Mey-er-ĭ-a′-num
Meyn′-ĭ-a
Mez-e′-rĕ-on
Mez-e′-rĕ-um
mic′-ans
Mich-aux′-ĭ-a
Mich-aux-ĭ-a′-num
Mich-aux′-ĭ-i
Mich-el′-ĭ-a
Mich-el′-ĭ-i
Mich-el′-li
Mi-co′-nĭ-a
Mi-cran′-dra*
mi-cran′-tha
Mi-cran-thel′-la
Mi-cran-the′-ra
Mi-croc-ach′-rys
Mi-croc-al′-ĭ-a
mi-croc-ar′-pa
Mi-croch-i′-lus
Mi-croc-oc′-cus
Mi-croc-y′-cas
mi-crod′-as-ys
mi′-crod-on
Mi-crog-as′-tēr
Mi-crog-en′-et-ēs
Mi-crog-lōs′-sa
Mi-crog-o′-nĭ-um
Mi-crog-ram′-me
mi-crog′-raph-us
Mi-crol-ep′-ĭ-a
Mi-crol-ep-id-op′-ter-a
Mi-crol-ic′-ĭ-a
Mi-crol-o′-ma
Mi-crom-er′-ĭ-a
mi-crom′-er-is
Mi-crom-yr′-tus
Mi-crop-e′-ra
Mi-crop-et′-al-on
mi-crop-et′-al-um
mi-croph-yl′-la
Mi-crop′-ip-er
mi-crop′-ter-a
mi-cros-cop′-ic-a
mi-cros′-cyph-a
Mi-cros-o′-rĭ-um
Mi-cros-per′-ma
Mi-cros-phæ′-ra
Mi-cros-taph′-yl-a
mi-cros-te′-ma
Mi-cros-teph′-ĭ-um
Mi-cros′-tyl-is
Mid-den-dorf-ĭ-a′-na
Mid-den-dorf′-ĭ-i
Mie-lich-of′-er-i
Mi-er′-ĭ-a
mi-ers-ĭ-ŏ-i′-dēs
Mik-an′-ĭ-a
Mik-an-ĭ-a′-na
mik-an-ĭ-ŏ-i′-dēs
Mi-le′-sĭ-i

mil-ford-en′-sis
mil-ĭ-a′-cĕ-um
mi-lit-a′-ris
Mil′-la
mil-lef-ol′-ĭ-a
mil-lef-ol-ĭ-a′-tum
Mil-leg-ra′-na
Mil-let′-tĭ-a
Mil-lĭ-a′-num
Mil-ling-to′-nĭ-a
Mil-nĕ-a′-na
Mil-titz′-ĭ-a
Mil-to′-nĭ-a
Mi-me′-tēs
mi′-mic-us
Mi-mo′-sa
Mi-mo′-sæ
mi-mo-sif-ol′-ĭ-a
Mi′-mul-us*
mi′-mus
Mi′-mus-ōps
Mi′-na
min′-ax
min-ĭ-a′-tus
min′-im-a
min′-or
min′-ta
min′-us
min-u-tis′-sim-a
min-u′-tum
Mi-quel′-ĭ-a
Mi-quel-ĭ-a′-na
Mi-quel′-ĭ-i
Mi-quel′-li
mi-ra′-bil-e
Mi-ra′-bil-is
mi-ra-do-ren′-sis
mi-ran′-dum
Mir-bel′-ĭ-a
Mis-canth′-us
Mis-cop-et′-al-um
mis-sou′-ric-a
mis-sou-ri-en′-sis
mis-tas-si′-nic-a
Mit-chel′-la
Mit-chel-lĭ-a′-na
Mit-el′-la
mit-el-lŏ-i′-dēs
Mit-i′-qui
mi′-tis
mi-tis′-sim-us
Mit-op-et′-al-um
Mit-rac-ar′-pum
mit-ræ-for′-mis
Mit-ra′-rĭ-a
Mit-ras-tig′-ma
mit-ra′-tum
Mit-rĭ-os-tig′-ma
mix′-ta
Mne-mos-il′-la
Moc-an-e′-ra
Moc-in-ĭ-a′-na
Mod-ec′-ca
mod-es′-tum
Mod′-ĭ-ol-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Mœhn′-ĭ-a
Mœhr-ing′-ĭ-a
Mœr-en-hout-ĭ-a′-na
mog-ad-o-ren′-sis
Mog-grid′-gĕ-i
Moh′-rĭ-a
moh-rĭ-ŏ-ĭ′-dēs
mol-da′-vic-um
Mol-i′-nĭ-a
Mol′-le
mol′-lĕ*
Mol′-lĭ-a
mol′-lic-eps
mol-lis′-sim-a
Mol-loy′-a
Mol-lu-gin′-ĕ-æ
Mo-lo-pos-per′-mum
Molt′-kĭ-a
Mol-uc′-ca
mol-uc-ca′-na
Mol-uc-cel′-la
mo-luc-cen′-sis
Mo′-ly*
Mom-or′-dic-a
mon-ac-anth′-a*
mon′-ach-a
Mon-ach-anth′-ŭs
Mon-ach-os-o′-rum
mon-ad-el′-pha
mon-anth′-em-um
Mon-anth′-ēs
Mon-ar′-da
Mon-ar-del′-la
Mon-el′-li
Mon′-es-ēs
mon-gol′-ic-a
Mon-i′-lĭ-a
mon-i-lif′-er-a
mon-i-lif-or′-mis
Mon-im′-ĭ-a
Mon-im-ĭ-a′-cĕ-æ
Mon-im′-ĭ-ĕ-æ
Mon-iz′-ĭ-a
Mon-nĭ-e′-ra
Mon-nĭ-e′-ri
Mon-ni′-na
Mon-ob-oth′-rĭ-um
mon-oc-eph′-al-a
Mon-oc′-er-a
mon-oc′-er-as
Mon-och-æ′-tum
Mon-och-i′-lus
mon-och′-lam-ys
Mon-och-o′-rĭ-a
mon-oc-oc′-cum
Mon-od′-or-a*
mon-og-ram′-me
mon-og′-yn-um
mon-oi′-ca
Mon-o′-len-a
Mon-ol′-oph-us
Mon-ol-o′-pĭ-a
Mon-om-er′-ĭ-a
Mon-op′-an-ax
mon-op-et′-al-a
mon-oph-yl′-la
Mon-op′-sis
mon-op′-ter-a
mon-op-yr-e′-num
Mon-or′-chis
mon-os-o′-rum
mon-os-per′-mum
mon-os-tach′-ŷ-a
Mon-oth-y′-lac-ĕ-um
Mon-ot′-oc-a
Mon-ot′-rop-a
Mon-ot-rop′-ĕ-æ
Mon-ox′-or-a
mon-re-ga-len′-sĕ
Mon-so′-nĭ-a
Mon-so′-nĭ-æ
mon-spel′-ĭ-ac-us
mon-spel-ĭ-en′-sis
mon-spel-ĭ-en′-sĭ-um
mon-spes-sul-a′-num
Mon′-ster-a
mon-stro′-sa
Mon-tag′-nĕ-a
mon-tal-ben′-sis
mon-ta′-na
Mon-ta′-no-a
Mont-bret′-ĭ-a
Mon-teir′-i
Mon-teir′-ŏ-i
mon-tev-id-en′-sis
Mon-tez-u′-ma
Mon-tez-u′-mæ
mon-tic′-ol-a
Mont-rich-ard′-ĭ-a
Moon′-ĭ-i
Moor-e-a′-na
Moor′-e-i
Mo-qui′-lĕ-a
Mo-qui′-lĭ-a
Mor-æ′-a
mor-bil-lo′-sum
Mor-chel′-la
Mor-dil-o′-na
Mor′-ĕ-æ
Mor-el′-i
Mor-el-ĭ-a′-na
Mor-el′-la
Mor-e′-nĭ-a
Mor-e′-nĭ-i
Mor-ga′-gni-a
Mor-gan′-ĭ-æ
Morg-sa′-na
mo′-ri
Mor-i-can′-dĭ-a
Mor-i′-na
Mor-in′-da
Mor-ing′-a
Mor-ing′-ĕ-æ
Mo′-rĭ-o
Mor-is-o′-nĭ-a
Mor-itz-ĭ-a′-na
Mor-mo′-dēs
Mor-mol′-yc-a
Mor′-na
Mor-on-o′-bĕ-a
Morph-ix′-ĭ-a
Mor-ren′-i
Mor-ren-ĭ-a′-na
Mor-ren′-ĭ-i
Mor′-sus-ra′-næ
Mor-tin′-ĭ-a
Mo′-rus
Mos-cha′-rĭ-a
mos-cha′-ta
Mos-cheu′-tos
Mo-sen′-ĭ-i
Mos-ig′-ĭ-a
Moss′-ĭ-æ
Mouf-fet′-ta
moul-mein-en′-sĕ
Mou′-tan
Mu-ce′-din-ēs
Mu′-cor
mu-cro-na′-ta
mu-cro-nif-ol′-ĭ-um
mu-cro-nul-a′-ta
Mu-cu′-na
Muehl-en-beck′-ĭ-a
Muel′-ler-a
Mu′-ghus
Muhl-en-berg′-i
Mu′-ki-a
Mul-ge′-dĭ-um
mul-tib-rac-tĕ-a′-tus
mul-tic-au′-lis
mul′-tic-eps
mul-tic′-ol-or
mul-tif′-id-a
mul-tif-lo′-ra
mul-tif-ur-ca′-ta
mul-tij′-ug-a
mul-tin-er′-va
mul′-tip-lex
mul-tir-ad-ĭ-a′-tus
mul-tis-ec′-tum
mu′-lus
Mu′-me
Mun-by-a -na
mun′-di
Mund′-tĭ-a
mun′-dul-a
mu-ni′-tum
Mun′-ja
Mun-ro-a′-num
Mun-ro′-i
Mun-ting′-ĭ-a
mu-ra′-lis
Mu-ralt′-ĭ-a
mu′-rex
mu-ric-a′-ta
mu-ri′-num
Mur-ray′-a
Mur-ray-a′-na
Mur-ray′-i
Mur-rel′-lĭ-a′-num
Mur-sel′-li
Mur-ton-ĭ-a′-na
Mu-ru-cu′-ja
Mu′-ru-Mu′-ru
Mus

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *aĭ* in *paĭn*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Mu′-sa
mu-sæ-fol′-ĭ-um
mu-sa′-ic-a
Mus-cæ-tox′-ic-um
Mus-ca′-ri
Mus-ca′-rĭ-a
Mus′-ci
mus-cif′-er-um
mus-cip′-ul-a
mus-cŏ-i′-dēs
Mu′-sĕ-æ
Mus-sœn′-da
Mus′-schĭ-a
Mus-schĭ-a′-num
Mus-sĭ′-ni
Mus-sĭ′-nĭ-a
Mus-te′-la
mu-ta′-bil-e
mu-ta′-ta
Mu-tel-li′-na
mut′-ic-a
mut-il-a′-ta
Mu-tĭ′-sĭ-a
Mu-tĭ′-sĭ-i
Mў-anth′-us
Myc-od-er′-ma
My′-con-i
My-con′-ĭ-a
Myg-in′-da
My-lam-ĭ-a′-na
Myl-i′-num
Myl-oc-ar′-ў-um
mў-op-æ-for′-mis
Mў-op-or-in′-ĕ-æ
mў-op-or-ŏ-i′-dēs
Mў-op′-or-um
mў-os-o′-tid-if-lo′-ra
Mў-os-o-tid′-ĭ-um
Mў-os-o′-tis*
mў-os-o-tŏ-i′-dēs
Mў-os-u′-rus
Myr′-cĭ-a
my-rĭ-ac-anth′-a*
My-rĭ-ad-e′-nus
My-rĭ-ap′-od-a
Myr-i′-ca
Myr-i-ca′-cĕ-æ
Myr-i-ca′-rĭ-a
myr-i-cŏ-i′-dēs
my-rĭ-oc-ar′-pum
My-rĭ-oc-eph′-al-us
My-rĭ-oph-yl′-lum
My-rĭ-op′-ter-is
my-rĭ-os-tig′-ma
Myr-is′-tic-a
myr-is-tic-æ-for′-mis
Myr-is-tic′-ĕ-æ
Myr-ob-al′-an-us*
Myr-ob-ro′-ma
Myr-o′-dĭ-a
Myr-os-per′-mum
Myr-ox′-yl-on
Myr′-rhis
Myr′-sin-e
Myr-sin′-ĕ-æ
Myr-sin-i′-tēs
Myr-siph-yl′-lum
Myr-stiph-yl′-lum
Myr-ta′-cĕ-æ
myr-tif-ol′-ĭ-a
myr-til-lŏ-i′-dēs
Myr-til′-lus
myr-tŏ-i′-dēs
Myr′-tus
my-so-ren′-sis
mys-tac′-in-um
my-su-ren′-sis
My-til-as′-pis
Myx′-a
Myx-om-yc-e′-tēs
Myz′-us

Nab′-al-us
Nac-ib-e′-a
Nœg-el′-ĭ-a
nœg-el-ĭ-ŏ-i′-dēs
Næ′-nĭ-a
næ -vĭ-um
Nag-ei′-a
Na′-gi
Nai-ad-a′-cĕ-æ
Na′-ma
na-ma-quen′-sis
na′-na
Nan-dĭ′-na
Nan-ki-nen′-sis
Nan′-norh-ops
Na-no′-dēs
Na-pæ′-a
na-pel-lŏ-i′-dēs
Na-pel′-lus
Na′-pi
na-pif-or′-mis
Nap-o-le-o′-na
Nar-av-e′-lĭ-a
nar-bo-nen′-sĕ
nar-cis′-sif-lo-ra
nar-cis-sŏ-i′-dēs
Nar-cis′-sus
Nar′-da
Nar-dos′-mĭ-a
Nar-dos′-tach-ys
nar-the-cĭ-ŏ-i′-dēs
Nar-the′-cĭ-um
Nar′-thēx
Nas-myth′-ĭ-a
Na′-so
Na-so′-nĭ-a
Nas-tur′-tĭ-um
na-su′-tum
nat-al-en′-sis
na-ta-lit′-ĭ-us
nat′-ans
Na-tĭ-o′-nis
Nat′-rix
Nau′-clĕ-a
Naum-berg′-ĭ-a
Nau′-plĭ-us
Nau-til-oc′-al-yx
Nav-ar-ret′-tĭ-a
Nav-e′-nĭ-a
na-vic′-ul-a
na-vic-ul-a′-ris
Ne-æ′-i
Nĕ-æ′-ra
nĕ-a-pol-it-a′-num
neb-ro′-den-sis
neb-ul-o′-sa
nec-a′-trix
Nec-tan′-dra*
Nec-tar-ob-oth′-rĭ-um
Nec-tar-os-cor′-dum
Nēc′-trĭ-a
Nēc-trĭ-a′-cĕ-æ
Nēc′-tris
Neem′-da
ne-glec′-tus
Neg′-un-do
neil-gher-ren′-sĕ
Neil′-lĭ-a
Neip-perg′-ĭ-a
Neit-ner′-ĭ-i
Ne′-ja
Nel-ĭ′-sĭ-i
Nel-it′-ris
Nel-so′-ni
nel-um′-bŏ-if-ol′-ĭ-um
Nel-um′-bŏ-um
Ne-mac-o′-nĭ-a*
Ne-mas′-tyl-is
Ne-mat-anth′-us
Ne-mat′-in-a
Ne-mat-oc′-er-as
Ne-mat-oph-yl′-lum
Ne-mat-os-tig′-ma
Ne′-ma-tus
Nem-ĕ-oph′-il-a
Nem-es′-ĭ-a
Ne′-mĭ-a
Ne-mop-anth′-ēs
Nem-oph′-il-a*
nem-or-a′-lis
nem-or-o′-sa
nem′-or-um
Ne-mos′-tyl-is
Ne′-mu
Neng′-a
Neng-el′-la
ne-nu′-phar
nĕ-ob-or-ĭ-en′-sis
nĕ-oc-al-e-don′-ic-um
nĕ-ŏg-*uin-e*-en′-sĕ
Nĕ-og′-yn-e
Nĕ-ol-ex′-is
nĕ-om-on-ta′-num
Nĕ-ot′-tĭ-a
Nĕ-ot-tid′-ĭ-um
Nĕ-ot′-tĭ-ĕ-æ
Nĕ-ot-top′-ter-is
nep-a′-len-sis
nep-au-len′-sis
Ne-pen-tha′-cĕ-æ
Ne-pen′-thēs

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

ne-pen-thŏ'-i-dēs
Nep'-et-a*
nep-et-æ-fol'-ĭ-a
nep-et-ŏ-ĭ'-dēs
Neph-el-aph-yl'-lum
Neph-el'-ĭ-um
Neph-ran'-dra*
Neph-ran-the'-ra
neph-ro-dĭ-ŏ-ĭ'-dēs
Neph-ro'-dĭ-um
Neph-rol'-ep-is
Neph-ros-per'-ma
Neph'-thyt-is
Nep-tic'-ul-a
Nep-tu'-nĭ-a
Ne-rĭ-e'-ne
Ne'-rĭ-i
ne-rĭ-if-ol'-ĭ-a
ne-rĭ-if-or'-mis
ne-ri-næ-flo'-rum
Ne-ri'-ne
ne-ri-nif-lo'-rum
Ner-is'-sa
Ne'-rĭ-um
Ner'-ter-a
Ner-ter'-ĭ-a
ner-vo'-sum
Ne-sæ'-a
Neu-beck'-ĭ-a
neu-berg-en'-sĕ
Neu-be'-rĭ-a
Neu-ber'-ti
Neu-dorf'-ĭ-a
Neu-man'-nĭ-a
Neu-man-nĭ-a'-na
Neu-rad'-ĕ-æ
Neu-ro'-dĭ-um
Neu-rol-æ'-na
Neu-rol-o'-ma
Neu-rop'-ter-a
Neur-os-per'-ma
Neur-ot'-er-us
Neus-tan'-thus
neus'-trĭ-a
nev-a-den'-sis
Ne'-vi-i
Nev-il'-lĭ-æ
New-ber'-ry-i
New-bould'-ĭ-a
New-el'-li
New-man'-ĭ-i
Ney-perg-ĭ-a'-na
Nhan-dir-o'-ba
Nhan-dir-o'-bĕ-æ
Nĭ'-bung
ni-cæ-en'-sĕ
Nic-an'-dra
Nick-el'-li
Nic-ol-a'-i
Ni-co-tĭ-a'-na
ni-co-tĭ-a-næ-fol'-ĭ-um
nic'-tit-ans
nid-path-en'-sis
Ni-dul-a'-rĭ-um
nĭ'-dus
Nĭ'-dus-av'-is
Nie-buh'-rĭ-a
Nier-em-berg'-ĭ-a
Nig-el'-la
Nig-el-las'-trum
nig-el-lif-lo'-ra
nig'-er
nig'-ra
nig-ra'-tum
nig-res'-cens
nig-ric-a'-na
nig'-ric-ans
nig-ric-or'-nis
Nig-rĭ'-na
nig'-rip-ēs
nig-rĭ'-ta
nig'-rum
nik-o-en'-sĕ
Nil
ni-lag-er'-ic-um
ni-lo'-tic-a
Nĭ'-ob-e
Nĭ'-pa
Ni-pa'-cĕ-æ
Niph-æ'-a
Niph'-et-os
Niph-ob'-ol-us
Niph-op'-sis
Nis-so'-lĭ-a
nit'-ens
nit'-id-a
niv-a'-lis
niv'-ĕ-a
Niv'-en-i
Niv-en'-ĭ-a
niv-o'-sus
No-ack'-ĭ-i
no-bil'-ĭ-or
no'-bil-is
no-bil-is'-sim-us
no-bil'-ĭ-us
No'-bla
No-ble-a'-num
Noc'-ca
Noc-cæ'-a
noc-til-u'-ca
Noc'-tu-a
Noc'-tu-æ
Noc'-tu-id-æ
Noc-tu-ĭ'-na
Noc-tur'-ni
no-da'-tum
no-dif-lo'-ra
no-do'-sa
Noi-set'-tĭ-a
Noi-set-tĭ-a'-na
Nol-a'-na
Nol-a-na'-cĕ-æ
no'-li-me-tan'-ger-e
No-lĭ'-na
Nol'-tĭ-a
Non-at-e'-li-a
Non'-ĕ-a
Non'-ne-a
non-scrip'-ta
noot-ka-ten'-sis
No-pal'-e-a
No-ran'-tĕ-a
Nord-man'-nĭ-a
Nord-man-nĭ-a'-na
Nor-man-by-a'-na
Nor-man-by'-i
Nor'-na
Nor-ōn'-hæ
Nor-te'-nĭ-a
North-ĭ-a'-na
not-a'-tus
Not-el-æ'-a*
Noth-och-læ'-na
Noth-oc-læ'-na
Noth-ol-æ'-na
Noth-ol-ĭ'-rĭ-on
Noth-os-cor'-dum
No-thri'-a
Not-ĭ-oph'-rys
No-tod-ont'-id-æ
Not-on-ĭ-a'-na
Not-os-par'-tĭ-um
No-ty'-lĭ-a
nov'-æ-ang'-lĭ-æ
nov'-æ-bel'-gĭ-æ
Nov'-æ-*Zeal-and'*-ĭ-æ
nov-eb-or-ac-en'-sĕ
Now-el-lĭ-a'-na
No-wod-wor'-sky-a
nu-bic'-ol-a
nu-big'-en-um
nuc-if'-er-um
nuc'-um
nu'-da
nu-da'-ta
nu-dic-au'-lis
nu-dif-lo'-rum
Num-id'-ic-a
num-is-ma'-tus
Nūm-mul-a'-rĭ-a
nūm-mul-a'-rĭ-æ-fol'-ĭ-a
Nun-nēz-ha'-rĭ-a
Nun-nēz'-ĭ-a
Nu'-phar
nu'-tans
nut-ka-en'-sis
nut-ka'-na
Nut-tal'-lĭ-a
Nut-tal-lĭ-a'-na
Nut-tal'-lĭ-i
Nuyt'-sĭ-a
Nyc-ta-gin'-ĕ-æ
Nyc-ta-gin'-ĭ-a
nyc-ta-gin-if-lo'-ra
Nyc-tanth'-ēs
Nyc-ter'-in-a
Nyc-ter-in'-ĭ-a
Nyc-ter'-ĭ-um
nyc-tic'-al-us
Nyc-toc'-al-os
Nyl-and'-tĭ-a
Nym-phæ'-a
Nym-phæ-a'-cĕ-æ
nym-phæ-if-ol'-ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art'; ā as in psā'-lmist; ĕ as in slĕn'-der; ē as in vē'-ined; ĭ as in thĭn; ī as in mach-ī'-nist; ŏ as in rŏt'-ten; ō as in vō'-ter; ŭ as in pow'-er-fŭl; ū as in rū'-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

nym-phæ-ŏ-i′-dēs
Nys′-sa
Nys-sa′-cĕ-æ

Oakes′-ĭ-a
ob-co′-nic-a
ob-cor-da′-tus
ob-cor-del′-lum
Ob-el-is-ca′-rĭ-a
O-ber-on′-ĭ-a
Ob-e′-sĭ-a
ob-e′-sum
ob-fus-ca′-ta
ob-li′-qua
ob-li-qua′-tum
ob-lit-er-a′-ta
ob-lon′-ga
ob-lon-ga′-tum
ob-lon-gif-ol′-ĭ-a
ob-ov-a′-ta
ob-ry-za′-tum
ob-scu-rel′-la
ob-scu′-rus
ob-sol-e′-tus
ob-tu′-sa
ob-tu-san′-gul-um
ob-tu-sa′-tum
ob-tu-sif-ol′-ĭ-a
ob-tu-sil′-ob-a
ob-tu-sil-ob-a′-ta
ob-val-la′-ris
ob-val-la′-tus
Oc-a′-næ
oc-cid-en-ta′-lis
oc-cul-ta′-na
o-ce-an′-ic-a
oc-el-la′-na
oc-el-la′-ta
Och′-na
Och-na′-cĕ-æ
o-chra′-cĕ-a
O-chran′-the*
o-chrĕ-a′-tum
O-chroc-ar′-pus
o-chrol-eu′-ca
O-chro′-ma
O-chrop′-ter-is
O-chro′-sĭ-a
o-cim-ŏ-i′-dēs
O′-cim-um
Oc-ot-e′-a
Oc-tad-es′-mĭ-a
oct-an′-dra
oc-tho′-dēs
Oc-to-mel′-es
Oc-to-mer′-ĭ-a
oc-to-pet′-al-a
oc-to-phyl′-lum
oc-ul-a′-tus
Oc′-ul-us
Oc′-ul-us-so′-lis
o-cym-if-ol′-ĭ-a
o-cym-ŏ-i′-dēs

O′-cym-um
O′-cy-pus
Od-i-er′-ĭ-a′-na
Od-on-tad-e′-nĭ-a*
Od-on-tar′-rhen-a
od-on-ti′-tēs
Od-ont-oc-ar′-pa
od-on-toch-i′-lum
Od-on-tog-lōs′-sum
Od-on-tol-o′-ma
Od-on-ton-e′-ma
Od-on-tos-o′-rĭ-a
Od-on-tos-per′-mum
od-o′-ra*
od-o-ra′-ta
od-o-ra-tis′-sim-a
Œ-ce-oc′-lad-ēs
Œd-e′-mon-e
Œd′-er-a
Œn-ec′-tra
Œn-ec-tri′-na
Œn-oc-ar′-pus
œn-oph′-il-a
Œn-oth-e′-ra*
Œn-oth-e′-ræ
Oër-sted′-ĭ-i
of-fic-i-na′-lis
of-fic-i-na′-rum
Of′-ti-a
O-hig-gin′-sĭ-a
o-hi-o-en′-sĕ
Oh-len-dorf′-f ĭ-a
O-i′-dĭ-um
Ol-ac-in′-ĕ-æ
Ol′-ax
Olb′-ĭ-a
olb-ĭ-en′-sis
Old-en-land′-ĭ-a
Old-field′-ĭ-a
Ol′-ĕ-a
Ol-ĕ-a′-cĕ-æ
ol-ĕ-æ-fol′-ĭ-a
Ol-ĕ-an′-der
Ol-ĕ-an′-dra
Ol-ĕ-a′-rĭ-a
Ol-ĕ-as′-ter
ol-ĕ-if′-er-a
ol-ĕ-if-ol′-ĭ-a
ol′-ens
ol-ĕ-ŏ-i′-dēs
ol′-ens
ol-er-a′-cĕ-a
Ol-fer′-sĭ-a
Ol′-gæ
ol-ig-an′-tha*
Ol-ig-oc-ar′-pha
ol-ig-oc-ar′-pus
Ol-ig-os′-cĭ-as
Ol-ig-os′-ma
ol-ig-os-per′-ma
ol-ig-ot′-rich-um
ol-it-o′-rĭ-a
ol-i-va′-cĕ-us
ol-i-væ-for′-mis
ol-i-va′-ris

Ol-iv-e′-ri
Ol-iv-e′-rĭ-a′-na
Ol-us-a′-trum
ol-ym′-pic-um
Om-al-anth′-us
O-men-ta′-rĭ-a
om-nil-ac′-er-um
om-niv′-or-a
Om-or-i′-ka
Om-phal-an′-drĭ-a*
Om-phal′-ĕ-a
Om-phal′-ĭ-a
Om-phal-ob′-ĭ-um
Om-phal-oc-oc′-ca
Om-phal-o′-dēs
On-ag-ra′-rĭ-ĕ-æ
on-cid-ĭ-ŏ-i′-dēs
On-cid′-ĭ-um*
On-coc-y′-clus
On-cor-rhyn′-chus
On-cos-per′-ma
On-is′-cid-æ
On-is′-cus
On-i′-tēs
On-ob-ro′-ma
On-ob′-rych-is
on-ob-rych-ŏ-i′-dēs
On-oc′-lĕ-a
on-oc-lĕ-ŏ-i′-dēs
On-o′-nis
on-op-or′-din-is
On-op-or′-don
On-op-or′-dum
On-os′-er-is*
On-os′-ma
on-os-mæ-flo′-ra
On-os-mo′-dĭ-um
on-us′-tum
on-ych′-in-a
On-ych′-ĭ-um*
O-os′-por-a
op-a′-ca
Op′-al-us
Op-er-cul-a′-rĭ-a
op-er-cul-a′-ta
Oph-el′-ĭ-a
Oph′-el-us
Oph-ĭ-oc-ar′-ŷ-on
Oph-ĭ-oc-aul′-on
Oph-ĭ-od-er′-ma
Oph-ĭ-og-lōs-sa′-cĕ-æ
Oph-ĭ′-og-lōs′-sĕ-æ
oph-ĭ-og-lōs-sŏ-i′-dēs
Oph-ĭ-og-lōs′-sum*
Oph-ĭ-op-ō′-gŏn
Oph-ĭ-or-rhi′-za
Oph-ĭ-ox′-yl-on
Oph-ryd′-ĕ-æ
Oph′-rys
Op-lis′-men-us
Op-loth-e′-ca
Op-op′-on-ax
Op-or-an′-thus
op-pos-it-if-ol′-ĭ-um
op-ul-if-lo′-ra

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in slĕn′-der; ē as in v*ē′*-ined; ĭ as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *good*, c in muscular, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

op-ul-ŏ-i′-dēs
Op′-ul-us
Op-un′-tĭ-a
Or-a′-nĭ-a
Orb′-ĕ-a
orb-ic-ul-a′-ris
orb-ic-ul-a′-ta
Or-bi-gny-a′-nus
or-bo′-na
Orch-es′-tēs
orch-id′-ĕ-a
Orch-id′-ĕ-æ
orch-id-if-or′-mis
Orch-id′-ĭ-um
orch′-id-ŏ-i′-dēs
orch′-ĭ-ŏ-i′-dēs
Orch′-is
Ord-ĭ-a′-nus
or-ĕ-ad′-ēs
or-eg-a′-na
Or-el′-i-a
Or-el-la′-na
or-en-o-cen′-sĕ
Or-ĕ-och′-ar-is
Or-ĕ-oc′-om-e
Or-ĕ-od-aph′-ne
Or-ĕ-od-ox′-a
Or-ĕ-op′-an-ax
Or-ĕ-oph′-il-a
or-gan-en′-sis
or-gy′-al-is
Or-gyi′-a
or-ĭ-en-ta′-lis
or-i-gan-if-ol′-ĭ-a
Or-i′-gan-um*
or-in-o-cen′-sĕ
Ŏ-ri-thal-i′-a
Ŏ-ri-thyi′-a
or-ix-en′-sĕ
Or-moc-ar′-pum
Or-mo′-sĭ-a
or-na-tis′-sim-um
or-na′-tum
or-nif-ol′-ĭ-a
Or-ni-tha′-rĭ-um
Or-ni-thid′-ĭ-um
Or-ni-thoc-eph′-al-us
Or-ni-thoch-i′-lus
Or-ni-thog′-al-um*
Or-ni-thog-lōs′-sum
or-ni-thop-od′-um
Or-ni-thop′-ter-is
Or-ni′-thop-us
or-ni-thorh-yn′-chum
Or-ni-thox-anth′-um
Or-ni′-troph-e
Or′-nus
Or-ob-anch-a′-cĕ-æ
Or-ob-anch′-e
Or-ob-el′-la
or-ob-ŏ-i′-dēs
Or′-ob-us
Or-on′-tĭ-ĕ-æ
Or-on′-tĭ-um
Or-oph-o′-ma

Or-oth-am′-nus
Or-ox′-yl-um
Orph-an-id′-ĕ-a
Orph-an′-id-is
Orph′-ĭ-um
Or-si′-ni-i
Ort-gies′-i
Ort-gies′-ĭ-a
Ort-gies-ĭ-a′-na
Ort-gies′-ĭ-i
orth-an′-tha
Orth-oc-ar′-pus
Orth-oc′-er-as
Orth-och-i′-lus
orth-op-leo′-tron
Orth-op-o′-gōn
Orth-op′-ter-a
Orth-os′-iph-ōn
Orth-os-tem′-ma
Orth-ros-anth′-us
Or-va′-la
Or-y′-za
Os-beck′-ĭ-a
Os-beck′-ĭ-i
Os-born′-ĭ-i
Os-kamp′-ĭ-a
Os-man′-thus
Os-mo′-dĭ-um
Os-mun′-da
os-mun-da′-cĕ-um
Os-sæ′-a
os-sif′-rag-um
Os-tĕ-os-per′-mum
os-trĕ-æ-for′-mis
os-trĕ-a′-tus
Os trow-ski-a′-na
Os-tru′-thĭ-um
Os′-trỹ-a
Os-y-a′-na
Os′-yr-is
O-tac-an′-thus
Ot-ak′-sa
Ot-an′-dra
O-tan′-thus
O-ta′-rĭ-a
Oth-e′-ra
Oth-on′-na
Oth-on-nop′-sis
O-tid′-ĭ-a
O-til′-is
O-ti-orh-yn′-chus
O-ti′-tēs
O-toch-i′-lus
O-top′-ter-a
O-tos-tem′-ma
Ot-tel′-i-a
Ot-to-nĭ-a′-na
Ot-to′-nis
Our′-eg-ou
Ou-ri′-sĭ-a
Ou-rou-pa′-ri-a
Ouse-ley-a′-na
Ou-tram-ĭ-a′-na
Ou-vir-an′-dra
o-va-lif-ol′-ĭ-a

o-va′-lis
o-va′-ta
o-va-tif-ol′-ĭ-a
Ovie′-da
o-vif′-er-a
o-vig′-er-um
O′-vil-la
ow-a′-ri-en′-sis
Ox-al-id′-ĕ-æ
ox-al-id-if-ol′-ĭ-a
Ox′-al-is
ox-ỹ-ac-an′-tha*
ox-ỹ-ac-an-thif-ol′-ĭ-a
ox-ỹ-ac-an-thŏ-i′-dēs
Ox-ỹ-an′-thus
Ox-yb′-aph-us
Ox-yc-ar′-pus
ox-yc-ed′-rus
Ox-yc′-er-os
Ox-yc-lad′-ĭ-um
ox-yc-oc-cŏ-i′-dēs
Ox-yc-oc′-cus
Ox-yd-en′-dron
Ox-yg-o′-nĭ-um
ox-yg-o′-nus
Ox-yl-ob′-ĭ-um
Ox-yp-et′-al-um
ox-yph-yl′-lum
ox-ys-ep′-al-a
Ox-ys′-por-a
Ox-ys-tel′-ma
Ox-yt′-rop-is
Ox-ỹ-u′-ra
Ox-ỹ-u′-ris
Oz-oph-yl′-lum
Oz-oth-am′-nus

Pach-id-en′-dron
Pach-ĭ′-ra
Pach-ou′-li
pach-ỹ-an′-tha*
pach-yb-ul′-bus
Pach-ych-i′-lus
Pach-yd-er′-is
Pach-yl-o′-ma
Pach-yl′-oph-us
Pach-y′-ne
Pach-yn-e′-ma
Pach-yn-eur′-um
pach-yph-lœ′-a
Pach-yph-yl′-lum
Pach-yph′-yt-um
Pach-yp-od′-ĭ-um
pach-yp′-ter-a
Pach-yrh-i′-zus
Pach-y′-sa
Pach-ys-an′-dra
Pach-ys′-tach-ys
Pach-ys-tig′-ma
Pach-ys′-tim-a
Pach-ys′-tom-a
pach-ỹ-u′-ra
pa-cif′-ic-a

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

pad-el′-la
Pad′-i
Pad′-ĭ-a
pad-if-ol′-ĭ-us
Pad′-us
Pæ-do′-rĭ-a
Pæ-der-o′-ta
Pæ-o′-nĭ-a
pæ-o-nif-lo′-rum
Pæs′-ĭ-a
pa-ga′-na
Pa′-gin-a
Pa-hu′-dĭ-i
Paiv′-æ
pal-æs-ti′-num
Pa-laf-ox′-ĭ-a
Pal-a′-va
pal-e-a′-cĕ-a
Pal′-ĕ-æ
pal-em-ban′-ic-us
Pal-ĕ-ol-a′-rĭ-a
pal-ĕ-ol-a′-ta
Pa-li-av-a′-na
Pal-ic-ou′-re-a
Pal-in-u′-ri
Pal-is-o′-ta
Pal-ĭ-u′-rus
Pal-las′-ĭ-a
Pal-las-ĭ-a′-na
Pal-las′-ĭ-i
Pal-la′-vĭ-a
Pal-lav-i-ci′-ni-a
Pal′-len-is
pal′-lens
pal-les′-cens
pal-lĭ-a′-tus
pal′-lid-a
pal-lid-if-la′-vens
pal-lid-if-lo′-ra
pal-lid-if-ol′-ĭ-us
pal-lid-is-pi′-na
pal-lid-iv-e′-nĭ-um
pal-lid′-ul-us
Pal-ma′-cĕ-æ
Pal′-mæ
pal-ma-tif′-id-um
pal-ma′-tum
Palm′-er-i
Pal-met′-to
Palm′-ĭ-a
Pal-mi′-ta
Pal-ton′-ĭ-um
pal-u-do′-sus
Pal-um-bi′-na
pal-us′-tris
Pan-æ′-tĭ-a
pan-am-en′-sĕ
Pan′-ax
Pan′-cher-i
Pan-crat′-ĭ-um
Pan′-dac-a
Pan-dan′-ĕ-æ
pan-dan-if-ol′-ĭ-um
pan′-dan-ŏ-i′-dēs
Pan′-dan-us
pan-do-ræ-fol′-ĭ-a
Pan-do′-rĕ-a
pan-du-ra′-ta
Pan-gĭ-a′-cĕ-æ
pa-nic-ul-a′-ta
pa-nic-ul-ig′-er-a
Pa′-nic-um
Pan-iz-zi-a′-nus
pan-nif-ol′-ĭ-us
pan-non′-ic-us
pan-no′-sa
pan-the-ri′-num
pan-toth′-rix
Pap-a′-ver
pap-a-ver-a′-cĕ-a
Pap-a-ver-a′-cĕ-æ
pap-a-ver-æ-flo′-ra
Pap-a′-ver-is
Pap-ay′-a
Pap-ay-a′-cĕ-æ
Paph-in′-ĭ-a
Pa-pil′-ĭ-o
pa-pil-ĭ-o-na′-cĕ-a
Pa-pil-ĭ-o-na′-cĕ-æ
Pa-pil-ĭ-o′-nid-æ
Pap-il′-læ
pap-il-la′-ris
pap-il-lo′-sa
Pap′-ul-æ
pap-y-rac-an′-tha
pap-y-ra′-cĕ-a
Pap-y′-rĭ-a
pap-y-rif′-er-a
Pap-y′-rus
Par-ac-ar′-ŷ-um*
Par-ac-le′-tus
Par-ad-i-san′-thus
Par-ad-i′-sĕ-æ
Par-ad-i′-si
Par-ad-i′-sĭ-a
par-ad-i′-sĭ-ac-a
par-ad-ox′-a
Par-ag-ram′-ma
par-ag-ua-rĭ-en′-sis
par-ag-uay-en′-sis
par-aib′-ic-a
Par-al′-ĭ-as
par-al-le-lop-ip′-ed-us
Par-an-eph-el′-ĭ-us
Par-an′-om-us
Par-ap-et-al-if′-er-a
par-as-i′-tic-a
Par-as-tran′-thus
Par-at-rop′-ĭ-a
Par-cel′-li
Par-dal-ĭ-an′-chēs
par-dal-i′-na
Par-dan′-thus
Par′-dĭ-a
par′-din-a
Par-duy′-na
Par-ech-i′-tēs
Par-ei′-ra
Par-ĭ-et-a′-rĭ-a
Pa-ri-na′-rĭ-um
Par′-is
Par-ish′-ĭ-i
Par-i′-tĭ-um
Par′-ker-i
Par-ker′-ĭ-a
Parkes′-ĭ-i
Park′-ĭ-a
Par-kin-so′-ni
Par-kin-so′-nĭ-a
Par-kin-so′-nĭ-a′-num
Parks′-ĭ-i
Par-la-to-re-a′-na
Par-la-to′-re-i
Par-men-ti-e′-ra
Par-men-ti-e′-ri
Par-men-ti-ĕ-rĭ-a′-na
Par-nas′-sĭ-a
par-nas-sif-ol′-ĭ-a
Par-och′-et-us
Par-on-ych′-ĭ-a
Par-on-ych′-ĭ-ĕ-æ
par-on-ych-ŏ-i′-dēs
Par′-qui
Par-rĭ′-tæ
Par-rot′-ĭ-a
Par′-ry-a
Par-ry-a′-na
Par′-ry-i
Par-son′-sĭ-a
Par-son′-sĭ-i
Par-then-ei′-on
par-then-if-ol′-ĭ-um
Par-then′-ĭ-um
par-ti′-tus
Par-vic-or-o-na′-ti
par-vif-lo′-ra
par-vif-ol′-ĭ-a
par-vis′-sim-um
par′-vul-a
par′-vum
Par-yph-os-phæ′-ra
Pas-cal′-ĭ-a
Pas′-pal-um
Pas-sif-lo′-ra
Pas-sif-lo′-rĕ-æ
Pass-ing-ham′-ĭ-i
Pas-tin-a′-ca
pat-ag-o′-nic-a
Pat-ag-o′-nul-a
Pat-an′-ĭ-a
pat-av-i′-na
Patch-ou′-li
pat-el-la′-ris
pat′-ens
pat-en-tir-os′-tris
Pat-er-so′-ni
Pat-er-so′-nĭ-a
Pat-ĭ-en′-tĭ-a
Pat-i′-ni
Pat-i′-nĭ-i
pat-oc-o-cen′-sis
Pat-rŭ′-nĭ-a
Pat-ri′-sĭ-a
Pat-tis-o-nĭ-a′-num
Pat-to′-nĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-*lmist; ĕ as in *slĕn′-*der; ē as in *vē′-*ined; ĭ as in *thĭn*; ī as in *mach-ī′-*nist; ŏ as in *rŏt′-*ten; ō as in *vō′-*ter; ŭ as in *pow′-er-fŭl*; ū as in *rū′-*ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in *c*uscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Pat-to-nĭ-a′-na
pat′-ul-um
pau-cif-lo′-ra
Paul-li′-nĭ-a
Paul-ow′-nĭ-a
pau-per′-cul-a
Pav-et′-ta
Pa′-vĭ-a
Pav-o′-nĭ-a
Pav-o′-nĭ-i
pa-vo-ni′-na
pa-vo′-nĭ-um
Pax-to′-ni
Pax-to′-nĭ-a
Pax-to-nĭ-a′-na
Pea-cock′-ĭ-i
Peak-ĭ-a′-num
Pear′-ce-a
Pear′-ce-i
Pec-ot′-tĕ-i
pec-tin-a′-cĕ-a
pec-tin-a′-ta
pec-tin-ic-or′-nis
pec-tin-if′-er-us
Pec′-tis
pec-tor-a′-le
Pe-dal-in′-ĕ-æ
Pe-dal′-ĭ-um
ped-a′-tum
ped-em-on-ta′-num
Ped-i-cul-a′-ris
Ped-i-lan′-thus*
Ped-i′-lĕ-a
Ped-i-lo′-nĭ-a
Ped-i-lo′-num
Pe-dro′-sĭ-a
ped-un-cul-a′-ris
ped-un-cul-a′-ta
ped-un′-cul-i
ped-un-cul-o′-sa
Peep′-la
Pe′-gan-um
Peir-esc′-ĭ-a
pe-kin-en′-sis
pel-ar-go-nĭ-if-o′-rum
Pel-ar-go′-nĭ-um
Pel-ec-yph′-or-a
Pel-eg-ri′-na
Pel-ex′-ĭ-a
pel-ic-a′-num
pel-ĭ-og-ram′-ma
pel-ĭ-ol-o′-sum
pel-ĭ-orh-yn′-chus
Pel-ĭ-os-an′-thēs
Pel′-lĕ-a
Pel-li-o′-nĭ-a
pel-lu′-cens
pel-lu′-cid-a
Pe-lon-as′-tēs
Pel-o′-rĭ-a
Pel-tan′-dra
Pel-tan-the′-ra
Pel-ta′-rĭ-a
pel-ta′-ta
pel-tid′-ĕ-um
pel-tif-ol′-ĭ-a
Pel-toph′-or-um
Pel-tos-tig′-ma
pel-vif-or′-mis
Pem-phi′-gus
Pe-næ′-a
Pe-næ-a′-cĕ-æ
pen′-dul-a
pen-dul-if-lo′-rum
pen-dul-i′-na
pe-nic-il-la′-ta
Pe-nic-il′-lĭ-um
pen-na′-ta
pen-na-tif-ol′-ĭ-us
pen-nig′-er-um
pen-nin-er′-vis
Pen-nis-e′-tum
penn-syl-va′-nic-um
pen′-nul-a
Pen-rhos-ĭ-en′-sis
Pen-ste′-mōn
Pent-ach-æ′-ta
pen-tach-ro′-mum
Pent-ad-ac′-tyl-is
Pent-ad-ac′-tyl-on
Pent-ad-es′-ma
pent-ag-o′-na
Pent-ag-o′-nĭ-a
pent-ag′-yn-a
Pent-ag-yn′-ĭ-a
pent-an′-dra
pent-an′-dræ
Pent-an′-drĭ-a
pent-an′-thus
Pent-ap-e′-ra
pent-ap-et-al-ŏ-i′-dēs
Pent-ap′-et-ēs
Pent-aph-il′-trum
Pent-aph-rag′-ma
Pent-aph-yl′-la
Pen-taph-yl′-lon
Pent-ap′-ter-a
Pent-ap-ter-yg′-ĭ-um
Pent-arh-aph′-ĭ-a
Pen′-tas
Pen-tat-ax′-is
Pent-land′-ĭ-a
Pent-land′-ĭ-i
Pent-ste′-mōn
Pent-ste′-rĭ-a
Pentz′-ĭ-a
Pep-er-id′-ĭ-um
Pep-er-o′-mĭ-a
Pep-in′-ĭ-a
Pep′-lis
pep-lŏ-i′-dēs
Pep′-o
Per-alt′-ĕ-a
Pe-ram′-ĭ-um
Pe-ran-e′-ma
per-bel′-la
per-cus′-sum
Per-di′-cĭ-um
Per′-dix
per-eg-ri′-num
Per-eir′-ĭ-a
per-e′-leg-ans
per-en′-nans
per-en′-nis
Per-esk′-ĭ-a
per-esk-ĭ-æ-fol′-ĭ-a
Pe-re′-zĭ-a
per-fol-ĭ-a′-ta
per-for-a′-tum
Per-gul-a′-rĭ-a
per-ĭ-ac-an′-thus*
Per-ib-œ′-a
Per-ic-al′-lis
Per-ic-al-ym′-na
Per-ic-lym′-en-um
per-i-cul-a′-rum
per-i-cul-o′-sa
Per-ic-y′-cla
Per-id-er′-mĭ-um
Per-il′-la
Per-il-o′-mĭ-a
Per-iph′-an-ēs
Per-iph-rag′-mos
Per-ip′-loc-a*
per-ip-loc-æ-fol′-ĭ-a
Per-is-por-a′-cĕ-i
Per-is-por-ĭ-a′-cĕ-æ
Per-is-por-ĭ-a′-cĕ-i
Per-is-ter′-ĭ-a
Per-is-troph′-e
Per-is′-tyl-is
Per-ith-e′-cĭ-um
Per-it′-om-a
Per-it-ym′-bĭ-a
per-mix′-ta
Per-net′-ty-a
Per-of-ski-a′-num
Per-o′-nĕ-a
Per-o′-nĭ-a
Per-on-os′-por-a*
Pe-ow-ski-a′-na
per-pen′-sa
per-pus-il′-lus
Per-ral-der-ĭ-a′-num
Per-ri-nĭ-a′-na
Per-ri′-nĭ-i
Per′-ry-i
Per-se′-a
Per′-sic-a
Per′-sic-æ
per-sic-æ-fol′-ĭ-a
per-sic-if-o′-ĭ-um
per′-sic-um
per-sol-u′-ta
Per-so-na′-tæ
Per-soon′-ĭ-a
Per-soon′-ĭ-i
per-spic′-ŭ-a
per-tu′-sum
per-u-if′-er-um
per-u-vĭ-a′-na
Pes-cat-o′-re-a
Pes-cat-o′-re-i
Pĕs′-cor′-vi
Pes-om-er′-ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as aĭ in paĭn; au as ou in house; g, c, and ch, always hard, as, for example, g in good, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Pes-tal-oz′-zæ
Pet-al-ac′-te*
Pet-al-id′-ĭ-um
pet-al-ŏ-i′-dĕ-um
Pet-al-ol′-ep-is
Pet-al-os-te′-mŏn
Pet-am′-en-ēs
pet-an′-dra
Pet-as-i′-tēs
Pet-as-os′-tyl-is
Pe-ters′-ĭ-i
pet-ĭ-ol-a′-ris
pet-ĭ-ol-a′-ta
Pet-iv-er′-ĭ-a
Pet′-ol-a
Pet-ou′-mo
Pet-ræ′-a
pet-ræ′-um
Pet-rarch′-æ
Pet′-ri
Pet-rob′-ĭ-um
Pet-roc-al′-lis
Pet-roc-ar′-ỹ-a
Pet-roc-op′-tis
Pet-rom-ar′-ul-a
Pet-roph′-il-a
Pet-roph′-ỹ-ēs
Pet-roph′-yt-um
Pet-ros-el-i′-num
Pet-ter′-ĭ-a
Pet-ung′-a
Pet-u′-nĭ-a
Peu-ced′-an-um
Peu′-mus
Pey-rous′-ĭ-a
Pez-iz′-a
Pfaf′-fĭ-a
Pfa′-vĭ-i
Pfeif′-fer-a
Pfeif-fer-el′-la
Pfeif′-fer-i
Pfeif-fer′-ĭ-a
Phac′-a
Phac-el′-ĭ-a
phac-el-ĭ-ŏ-i′-dēs
phæ-ac-an′-tha
Phæ′-don
Phæd-ran-as′-sa
Phæn-oc-o′-dōn
Phæn-oc′-om-a
Phæn-op′-od-a
Phæn-os-per′-ma
phæ-os-te′-mŏn
Phæ-os′-tom-a
phæ′-um
Phai′-us
Pha′-jus
Phal-ac-ræ′-a
Phal-ac-rol-o′-ma
Pha-lac-rom′-es-us
Phal-æ′-na
Phal-æ-nop′-sis
Phal-ang′-ĭ-um
Phal′-ar-is
phal-ar-ŏ-i′-dēs
Phal-e′-rĭ-a
Phal-la′-rĭ-a
Phal-loc-al′-lis
Phan-er-oph-leb′-ĭ-a
Phar-bi′-tis
Pha′-rĭ-um
Phar-nac-e′-um
Pha′-rus
phas-ĕ-ol-ŏ-i′-dēs
Phas′-ĕ-ol-us
Pheb-al′-ĭ-um
Phe-gop′-ter-is
Phe-lip-æ′-a
Phel′-los
Phen-ak-os-per′-mum
Pher-ot′-rich-is
Phi′-al-is
Phil-ad-el′-phĕ-æ
phil-ad-el′-phic-um
Phil-ad-el′-phus*
Phil-*ag-e′*-rĭ-a*
Phil-brick-ĭ-a′-na
Phil-e′-sĭ-a
Phil-e-sĭ-a′-cĕ-æ
Phil-ib-er′-tĭ-a
phil-ip-pi-nen′-sis
Phil-ip′-po-*Co-bur′-gi*
Phil-lip-ĭ-a′-na
Phil-lyr′-ĕ-a
phil-lyr-ĕ-æ-fol′-ĭ-a
phil-lyr-æ-ŏ-i′-dēs
Phil-od-en′-dron
Phil-og′-yn-e
Phil-oth-e′-ca
Phil-yd-ra′-cĕ-æ
Phil-yd′-rum
Phin-æ′-a
Phleb-ig-o′-nĭ-um*
Phleb-ĭ-oph-yl′-lum
Phleb-o′-dĭ-um
Phleg-ma′-rĭ-a
Phle′-um
Phlog-ac-an′-thus
phlog-if-lo′-ra
Phlom′-is
phlom-ŏ-i′-dēs
Phlox
phœn-i′-cĕ-us
phœn-i′-cĭ-a
phœn-i-cif-ol′-ĭ-us
phœn-i′-col-as′-ĭ-us
Phœn-i-coph-or′-ĭ-um
Phœn′-ix
Phol-id-oc-ar′-pus
Phol-id-oph-yl′-lum
Phol-id-o′-ta
Pho′-ma
Pho-niph′-or-a
Phor′-bĭ-a
Phor′-mĭ-um
Phor′-od-on
Pho-ti′-nĭ-a
Pho-ti-nop′-ter-is
Phox-an′-thus
Phrag-mat-ob′-ĭ-a
Phrag-mid′-ĭ-um
Phra-to′-ra
phryg′-ĭ-a
Phry′-ma
phry-nĭ-ŏ-i′-dēs
Phry′-nĭ-um
Phu
Phu-op′-sis
Phy-cel′-la
Phyg-an′-thus
Phyg-e′-lĭ-us
Phyl′-ic-a
phyl-ic-if-ol′-ĭ-a
phyl-ic-ŏ-i′-dēs
Phyl-lach′-ne*
Phyl-lac-ti′-nĭ-a
Phyl-lag′-ath-is
Phyl-lam′-phor-a
phyl-lan-thŏ-i′-dēs
Phyl-lan′-thus
Phyl-lar′-thron
Phyl-lau′-rĕ-a
Phyl-ler′-ĭ-um
Phyl′-lis
Phyl-li-ti′-dēs
Phyl-lob′-ĭ-us
Phyl-loc-ac′-tus
Phyl-loc′-al-yx
Phyl-loc-e′-rĕ-us
Phyl-loc′-lad-us
Phyl-loc-y′-clus
Phyl-lo′-dēs
Phyl-lo′-dĭ-um
Phyl-lod′-oc-e
phyl-log-lōs′-sum
Phyl-lol-ob′-ĭ-um
Phyl-lo′-ma
phyl-lo-man′-ĭ-ac-a
Phyl-lop-er′-tha
Phyl-los-tach′-ỹ-a
Phyl-los′-tach-ys
Phyl-los-tic′-ta
Phyl-lo′-ta
Phyl-lot-æn′-ĭ-um
Phyl-lot′-ret-a
Phyl-lox′-er-a
Phy-mat-an′-thus
phy-mat-och-i′-lum
Phy-mat-o′-dēs
phy-mat-oth-e′-le
Phy-mo′-sĭ-a
Phy′-sal-is*
phy-sal-ŏ-i′-dēs
Phy-sap′-ter-is
Phy-se-mat′-ĭ-um
Phy-sĭ-an′-thus
Phy-sid′-ĭ-um
Phy-sing′-a
Phy-soc-al-yc′-ĭ-um
Phy-soch-lai′-na
Phy-sod-ei′-ra
phy-so′-dēs
Phy-sol-ob′-ĭ-um
Phy-sop′-od-a
Phy-sos′-iph-ōn

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ă*p-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ỹ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Phy-sos-per′-mum
Phy-sos-teg′-ĭ-a
Phy-sos-tel′-ma
Phy-sos-tig′-ma
Phy-su′-rus
Phyt-ar-rhi′-za
Phyt-el′-eph-as*
Phyt-el-eph-u′-sĭ-ē-æ
Phyt-eu′-ma
Phyt-oc-re′-ne
Phyt-oc-re′-nē-æ
Phyt-ol-ac′-ca
Phyt-ol-ac-ca′-cē-æ
phyt-ol-ac-cŏ-ī′-dēs
Phyt-om-y′-za
Phyt-oph′-thor-a
Phyt-op′-ti
Phyt-op′-tid-æ
Phyt-op′-tus
Phyt-ox′-is
Pi-ar-an′-thus
Pic′-ĕ-a
pich-inch-en′-sis
pic-ip′-ēs
Pi-co′-tĭ-a
Pic-rad-e′-nĭ-a
Pic′-rĭ-a
Pic-roph-læ′-um
Pic-rorh-i′-za
Pic-te′-tĭ-a
pic-tif-ol′-ĭ-a
pic-to′-rĭ-us
pic-tu-ra′-ta
pic′-tus
Pid-ding-to′-nĭ-a
Pi-er-ar′-dĭ-i
Pier′-cĕ-a
Pi′-er-is
Pig-af-et′-ta
Pil′-cher-i
Pi′-lĕ-a*
Pi-lĕ-an′-thus
pi-lĕ-orh-i′-za
Pil-grim′-ĭ-i
pil-if′-er-um*
pil-ig′-er-a
Pil-ler-ĭ-a′-na
Pi-loc-ar′-pus
Pi-loc-e′-rĕ-us
Pi-log′-yn-e
Pi-loph′-or-a
pil-o′-sa
Pil-o-sel′-la
pil-o-sel-lŏ-i′-dēs
pil-o-sis′-sim-a
pil-o-sĭ-us′-cul-a
Pil-ul-a′-rĭ-a
pil-ul-if′-er-a
Pi-lum′-na
Pi-mel′-ĕ-a
pi-mel-ĕ-ŏ-i′-dēs
Pi-men′-ta
Pim-pin-el′-la
pim-pin-el-læ-fol′-ĭ-a
Pim-pin-el-lif-ol′-ĭ-æ

Pi-na′-cĕ-æ
Pin-al′-ĭ-a
Pin-ang′-a
Pi-nar′-dĭ-a
Pi-nas′-ter
pi-nas′-tri
Pin′-cĕ-a′-na
Pin-cen-ict-it′-ĭ-a
Pinck′-ney-a
Pin′-der-i
Pin′-drow
pi′-nĕ-a
Pin-el′-lĭ-a
pi-ne-to′-rum
Pin-guic′-ul-a
pin-guif-ol′-ĭ-a
Pi′-ni
pi-nĭ-a′-rĭ-a
pi-nic-ol-a′-na
pi-nif-ol′-ĭ-a
pi-nip-er′-da
Pink′-nĕ-a
Pink′-ney-a
pin-na′-ta
pin-na-tif′-id-um
pin-na′-tif-rons
pin-na-tin-er′-va
pin-na-tis-tip′-ul-a
Pin-sa′-po
Pi′-nus
Pi-on-an′-dra
Pi-o′-nĕ-a
Pi-on-no′-tēs
Pi-oph′-il-a
Pip′-er*
Pip-er-a′-cĕ-æ
Pip-er-el′-la
pip-er-i′-ta
Pip-tad-e′-nĭ-a
Pip-tan′-thus
Pip′-toc-lai′-na
Pip-tos′-path-a
Pi-que′-ri-a
Pir-ig-a′-ra
Pir-i-que′-ta
Pir-on-neau′-a
pi-sac-om-en′-sis
pi-sa′-na
Pi-sau′-ra
Pis-ci′-dĭ-a
Pi′-si
pi-sif′-er-a
pi-soc-ar′-pa
Pi-so′-nĭ-a
Pis-sar′-dĭ-i
Pis-so′-dēs
Pis-ta′-cĭ-a
Pis′-tĭ-a
Pis-to-ri′-nĭ-a
Pi′-sum
Pit-at′-ach-e
Pit-cairn′-ĭ-a
pit-cairn-ĭ-æ-fol′-ĭ-a
Pitch′-er-i
Pith-e-coc-ten′-ĭ-um

Pith-e-col-ob′-ĭ-um
Pit-to′-ni
Pit-tos-por′-ĕ-æ
Pit-tos′-por-um
Pit-y-roph-yl′-lum
pla-ca′-ta
Plac′-e-a
Pla′-cĕ-i
Pla-co′-dĭ-um
Plac-o′-ma
Plad-e′-ra
Plag-ĭ-an′-thus*
Plag-ĭ-og-y′-rĭ-a
Plag-ĭ-o-li′-rĭ-on
Plag-ĭ-ol-ob′-ĭ-um
Plag-ĭ-oph-yl′-lum
Plan-e′-ra
pla-nic-au′-le
pla-nif-lo′-ra
pla-nif-ol′-ĭ-um
pla-nil-ab′-rĕ
plan-ta-gin′-ĕ-a
Plan-ta-gin′-ĕ-æ
Plan-ta′-gin-is
Plan-ta′-go
Plant′-ĭ-a
Plan′-tĭ-i
pla′-num
Plas-mo-dĭ-oph′-or-a
Plat-an-a′-ce-æ
plat-an-if-ol′-ĭ-um
plat-an-ŏ-i′-dēs
plat-an′-tha
Plat-an-the′-ra
Plat′-an-us
pla-ten′-sis
Plat-o′-nĭ-a
plat-yc-an′-tha*
Plat-yc-ap′-nos
plat-yc-ar′-pa
Plat-yc-ar′-pha
Plat-yc-ar′-pum
Plat-yc-ar′-ў-a
plat-yc-en′-tra
Plat-yc-er′-ĭ-um
Plat-ych-i′-lum
plat-yc′-lad-a
Plat-yc-li′-nis
Plat-yc-o′-dōn
Plat-yc-ra′-ter
plat-yg-lōs′-sa
Plat-yl′-ep-is
Plat-yl-ob′-ĭ-um
Plat-yl-o′-ma
Plat-yl′-oph-us
Plat-ym-e′-tra
plat′-ў-od-on
plat′-ў-on-yx
Plat-yp-et′-al-um
plat-yph-yl′-la
plat-yph-yl′-los
Plat-yp′-ter-is
plat-yrh-yn′-chos
plat-ys′-path-a
Plat-ys-tach′-ў-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in *rŏt′*-ten; ō as in *vō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Plat-ys′-tach-ys
Plat-ys-te′-mŏn
Plat-ys-tig′-ma
Plat-ys′-tyl-is
Plat-yth-e′-ca
Plat-yz-a′-mĭ-a
Plat-yz-o′-ma
Platz-man′-ni
pleb-ei′-um
Plec-os-o′-rus
Plec-toc-eph′-al-us*
Plec-toc-om′-ĭ-a
Plec-tog′-yn-e
plec-tol′-ep-is
Plec-tran-the′-ra
plēc-tran-thif-ol′-ĭ-a
plēc-tran-thŏ-i′-dēs
Plēc-tran′-thus*
Plēc-tri′-tis
Plēc-tro′-nĭ-a
Plēc-tru′-rus
Plee′-a
plei-och-ro′-ma
plei-og′-on-us
Ple′-ĭ-on-e
Plei-on-e′-ma
ple-nis′-sim-us
ple′-nus
Plĕ-oc-ne′-mĭ-a
Plĕ-om′-el-e
Plĕ-op-el′-tis
Ple-os′-por-a
Ple-ro′-ma
ple-sĭ-os-o′-rum
Pleur-an′-dra
Pleur-an′-the
Pleur-id′-ĭ-um
Pleur-oc-oc′-cus
Pleur-og-ram′-me
Pleur-og′-yn-e
Pleur-op-et′-al-um
Pleur-os-per′-mum
pleur-os′-tach-ys
Pleur-oth-al′-lis
plic-a′-ta
plic-ig′-er-um
Ploc′-am-a
Ploc-og-lōt′-tis*
Ploc-os-tem′-ma
Plo-ess′-lĭ-a
Plu′-chĕ-a
plu′-ma
plu-mæ-for′-mis
plu-ma′-rĭ-us
plu-ma′-tum
Plum-ba-gel′-la
Plum-ba-gin′-ĕ-æ
plum-ba-gin-ŏ-i′-dēs
Plum-ba′-go
plum′-bĕ-a
Plu-me′-rĭ-a
Plu-mĭ-e′-ri
plu-mo′-sa
Plu′-mul-a
Plu′-rid-ens
Plu′-sĭ-a
Plu-tel′-la
Pneu-mon-an′-the
Pŏ′-a
pŏ-ar′-um
Poc-ock′-ĭ-a
po-cul-if-or′-mis
Pod-ach-æn′-ĭ-um
pod-ag′-ric-a
Pod-al-y′-rĭ-a
pod-al-y-rĭ-ŏ-i′-dēs
Pod-an′-thēs
Pod-an′-thus
pod-ic-ar′-pum
Pod-is-o′-ma
Pod-oc-al′-lis
Pod-oc-ar′-pĕ-æ
Pod-oc-ar′-pus
Pod-ol-a′-sĭ-a
Pod-ol′-ep-is
Pod-ol-ob′-ĭ-um
Pod-op-el′-tis
pod-oph-thal′-ma
Pod-oph-yl′-lum
Pod-op′-ter-us
Pod-o′-rĭ-a
Pod-os-per′-ma
Pod-os-per′-mum
Pod-os-phæ′-ra
Pod-os-te-ma′-cĕ-æ
Pod-os-te′-mŏn
Pod-os-tig′-ma
Pod-oth-e′-ca
Pœc-il-ip′-ter-is
Pœc-il-os-o′-ma
Pœp-pig′-ĭ-a
*Pœp-pig-*ĭ-a′-na
Pœp-pig′-ĭ-i
Pœ′-sĭ-a
pŏ-e-ta′-rum
pŏ-e′-tic-us
*Pog-gen-dorf″-f*ĭ-a
Po-gog′-yn-e*
Po-go-nel′-la
Po-go′-nĭ-a
Po-go′-nop-us
Po-gos-te′-mŏn
*Pohl-*ĭ-a′-na
Pohl′-ĭ-i
Poin-cĭ-a′-na
*Poin-set′-*tĭ-a
*Poi-re′-*tĭ-a
Poi-tæ′-a
Poiv′-rĕ-a
Pol-an-is′-ĭ-a
Pole-man′-nĭ-a
Pol-em-o-nĭ-a′-cĕ-æ
Pol-em-o′-nĭ-um
Pol′-ĭ-a
Pol-ĭ-an′-thēs
pol-if′-er-us
pol-if-ol′-ĭ-a
pol-ĭ-if-ol′-ĭ-a
pol-i′-ta
Pol′-ĭ-um
Pol-lic-a′-ris
*Pol-lich′-*ĭ-a
*Pol-li′-ni-*a
*Poll-ver′-*ĭ-a
pol-ў-ac-an′-tha*
Pol-ў-ac-tid′-ĭ-um
Pol-ў-ac′-tis
Pol-ў-ad-el′-phĭ-a
Pol-ў-al′-thĭ-a
Pol-ў-an′-drĭ-a
pol-ў-an′-drum
pol-ў-an′-tha
Pol-ў-an′-thēs
pol-ў-an′-thos
Pol-ў-an′-thus
Pol-yb-æ′-a
Pol-yb-ot′-rў-a
Pol-yc-al-ym′-ma
Pol-yc-am′-pĭ-um
Pol-yc-ar′-pa
Pol-yc-ar-pæ′-a
Pol-yc-ar′-pĭ-a
pol-yc-eph′-al-us
Pol-ych-i′-los
pol-ych-lo′-ros
Pol-yc-yc′-nis
pol-yd-ac′-tyl-a
pol-yd-ac′-tyl-on
Pol-yd-es′-mus
Pol-yg′-al-a
pol-yg-al-æ-fol′-ĭ-um
Pol-yg-al′-ĕ-æ
pol-yg-al-if-ol′-ĭ-a
pol-yg′-am-a
Pol-yg-on-a′-cĕ-æ
Pol-yg-on-as′-trum
Pol-yg-on′-at-um
Pol-yg-on′-ĕ-æ
Pol-yg-on′-ĭ-um
pol-yg-on-ŏ-i′-dēs
Pol-yg′-on-um
Pol-ym′-nĭ-a
pol-ym-orph′-um
pol′-ў-od-on
Pol-yp-ap′-pus
Pol-yp′-ar-a
pol-yp-et′-al-a
Pol-yph-e′-ma
pol-yph-yl′-la
pol-yp-od′-in-a
pol-yp-od-ĭ-ŏ-i′-dēs
Pol-yp-od′-ĭ-um
Pol-yp′-or-us
Pol-yp′-rem-um
Pol-yp′-ter-is
Pol-ys′-cĭ-as
pol-ys-per′-ma
Pol-ys′-por-a
Pol-ys-tach′-ў-a
pol-ys-tach′-ў-on
pol-ys-tich-ŏ-i′-dēs
Pol-ys′-tich-um
pol-ys-tic′-ta
Pol-ys-tig′-ma
Pol-yt-æ′-nĭ-um

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in h*ou*se; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Pol′-yth-rix
Pol-yt′-rich-um
pol-yx-an′-thum
Pol-yx′-en-a
Pol-yz-o′-ne
po-ma′-cĕ-a
Po-ma′-cĕ-æ
Po-mad-er′-ris
Po-ma′-rĭ-a
po-ma′-tĭ-a
Po-mat-oc-al′-pa
Po′-max
Pom-bal′-ĭ-a
Po′-mĕ-æ
Po-mel′-ĭ-a
po-mer-i′-dĭ-a′-num
po′-mi
po-mif′-er-a
Po-mo-na′-na
po-mo′-rum
pom-pay-an-en′-sĕ
pom-po′-nĭ-a
Pon-cel-e′-tĭ-a
pon-der-o′-sa
Pon-e′-ra
Pon-ga′-mĭ-a
Pon-ted-e-ra′-na
Pon-ted-e′-rĭ-a
Pon-ted-e-rĭ-a′-cĕ-æ
Pon-thie′-va
Pon′-tĭ-a
pon′-tic-a
Po′-pe-i
po-pul-if-ol′-ĭ-a
po-pul′-nĕ-a
Po′-pul-us*
Po-ra′-na
Por-an-the′-ra
por-cel′-lic-eps
Por-cel′-lĭ-o
Por-cel′-lus
por-ci′-na
Por-li-e′-rĭ-a
Por-os-te′-ma
Por′-pax
Por′-phyr-a
por-phyr-an′-tha*
por-phyr-a′-ta
por-phyr′-ĕ-um
por-phyr′-ĭ-o
por-phyr-oc-ar′-pon
Por-phyr-oc′-om-a
por-phyr-oph-yl′-lum
por-phyr-os′-pil-um
Por-phyr-os′-tach-ys
por-phyr-os-te′-le
por-rif-ol′-ĭ-um
por′-rig-ens
Por′-rum
Por′-tĕ-a
Por-tĕ-a′-na
Por′-tĕ-i
Por-tel′-læ
Por-ten-schla′-gĭ-a
Por-ten-schla-gĭ-a′-na
por-ten-to′-sa
Port-land′-ĭ-a
Por-tul-a′-ca
por-tul-a′-cæ-fol′-ĭ-a
Por-tul-a-ca′-rĭ-a
Por-tul-a-cas′-trum
Por-tul-a′-cĕ-æ
por-tul-a′-cif-ol′-ĭ-a
Pos-el-ger′-ĭ-i
Pos-o-que′-rĭ-a
pos′-tum-a
Pot-am-og-e′-ton
pot-am-oph′-il-a
pot-a-to′-rum
Pot-en-til′-la
Pot-en-til′-lĕ-æ
pot-en-til-lŏ-i′-dēs
Pot-e′-rĭ-ŏ-æ
Pot-e′-rĭ-um
poth′-ŏ-in-a
Poth-om-or′-phe
Poth′-os
Pott′-sĭ-i
Poul′-ter-i
Pou-par′-tĭ-a
Pou-rou′-ma
Pour-re′-tĭ-a
Pousch′-kin-i
præ-al′-ta
præ′-cox
præ-mor′-sa
præ′-nit-ens
præ-rup-to′-rum
præ′-stans
præ-tex′-tum
Pras-an′-thĕ-a*
pras-ĭ-a′-ta
pras′-in-a
pras-in-a′-ta
Pras′-in-us
Pras-oph-yl′-lum
pra-ten′-sis
Pra′-tĭ-a
prec-a-to′-rĭ-us
Preis-sĭ-a′-na
Preis′-sĭ-i
Prem′-na
Pre-nan′-thēs
Prep-tan′-the
Prep-u′-sa
Pres-cot′-ĭ-a
Pres-cot′-tĭ-a
Presl′-ĭ-a
Presl′-ĭ-a′-na
Presl′-ĭ-i
Pres-to′-ĕ-a
Pres-to′-nĭ-a
pres-ton-ĭ-en′-sis
Priest′-ĭ-i
Priest′-ley-a
Pri′-mul-a*
Pri-mul-a′-cĕ-æ
pri-mul-æ-flo′-rus
pri-mul-æ-fol′-ĭ-a
pri-mul′-in-us
pri-mul-ŏ-i′-dēs
prin′-ceps
prin′-cip-is
pri-nŏ-i′-dēs
Pri′-nos
Pri′-nus
prĭ-o-ni′-tis
Prĭ-o′-nĭ-um
prĭ-o-noph-yl′-lum
pris-mat′-ic-a
Pris-mat-oc-ar′-pus
Pritch-ar′-dĭ-a
Pritch-ar′-dĭ-i
Prit-zel′-ĭ-a
Pri′-va
prob-os-cid-a′-lis
Prob-os-cid′-ĕ-us
Pro-ce′-rus
pro-ces-sĭ-o′-nĕ-a
Proch′-ĭ-a
Proc-le′-sĭ-a
proc-le-sĭ-ŏ-i′-dēs
pro-cum′-bens
pro-cur′-rens
pro-duc′-tum
Prof-er′-ĕ-a
prof-u′-sa
Pro′-iph-ys
pro-let-el′-la
pro-lif′-er-um
pro-lif′-ic-um
Prom-en-æ′-a
Pron-ay′-a
pro′-nub-a
Prop-a′-gin-ēs
pro-pen′-dens
Pro-phyl′-la
prop-in′-qua
pro-re′-pens
Pros-ap′-ĭ-a
Pros-ar′-tēs
Pros-e′-lĭ-a
Pros-er-pin-a′-ca
pros-er-pin-a-cŏ-i′-dēs
Pros-o′-pis
Pros-tan-the′-ra
pro-stra′-tum
Pro′-tĕ-a
Pro-tĕ-a′-cĕ-æ
Pro-tein-oph-al′-lus
pro-tru′-sum
Proust′-ĭ-a
Prov-en-za′-lĭ-a
pro-vin-cĭ-a′-lis
prox-im-a′-na
prŭ-i-na′-ta
prŭ-i-no′-sa
Pru′-it-i
Prum-nop′-it-ys*
Pru′-nĕ-æ
Pru-nel′-la
pru-nel-lŏ-i′-dēs
Pru′-ni
pru-nic-i′-da
pru-nif-ol′-ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-inéd*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

pru-nif-or′-mis
Pru-nop′-sis
pru′-nul-us
Pru′-nus
pru′-rĭ-ens
pru-rĭ′-ta
Psal-lĭ-o′-ta
Psam′-ma
Psam-mĭ′-sĭ-a
Pseud-ac-a′-cĭ-a
Pseud-æ′-gle
Pseud-al-ang′-ĭ-um
Pseud-ath-yr′-ĭ-um
pseud-ep-id-en′-drum
pseud′-ŏ-ar-me′-rĭ-a
Pseud′-ŏ-*bar-le′*-rĭ-a
Pseud′-ŏ-bom-by′-cēs
Pseud′-ŏ-cap′-sic-um
pseud′-ŏ-cer′-as-us
pseud′-ŏ-cyp-e′-rus
Pseud′-ŏ-cyt′-is-us
Pseud′-ŏ-drac-on′-tĭ-um
pseud′-ŏ-*ger′-va-o*
Pseud′-ŏ-lar′-ix
Pseud′-ŏ-pan′-ax
Pseud′-ŏ-plat′-an-us
Pseud′-ŏ-scor′-dum
pseud′-ŏ-su′-ber
Pseud′-ŏ-*tsu′-ga*
psi
Psid′-ĭ-um
Psi′-la*
Psi-lod-och′-ĕ-a
Psi-log′-yn-e
Psi-lon-e′-ma
Psi-los-an′-thus
psi-los-ep′-al-us
Psi-los-te′-mōn
Psi-los′-tom-a
Psi-lo′-tum
Psith-yr-is′-ma
psit-tac-i′-na
psit-tac-o′-rum
Pso-ral′-ĕ-a
Psy′-che*
Psy-chech-i′-lus
Psy-cho′-dēs
Psy-chot′-rĭ-a
Psy-chot′-roph-um
Psyd′-rax
Psyl′-la
Ptar′-mic-a
Ptel′-ĕ-a
ptel-ĕ-ŏ-i′-dēs
Ptel-id′-ĭ-um
pter-id-if-ol′-ĭ-a
Pter′-is
Pter′-ĭ-um
Pter-oc-ar′-pus*
Pter-oc-ar′-ŷ-a
Pter-oc-eph′-al-us
Pter-och-i′-lus
pter-oc′-lad-on
Pter-oc-oc′-cus
Pter-od-is′-cus
pter-ŏ-i′-dēs
Pter-ol-ob′-ĭ-um
Pter-o-lo′-ma
Pter-on-eu′-rum
pter-oph′-or-a
Pter-oph-or-i′-na
Pter-oph-yl′-lus
Pter-oph′-yt-on
Pter-op′-sis
Pter-os-per′-mum
Pter-os′-por-a
Pter-os-tel′-ma
Pter-os′-tyl-is
Pter-os′-tyr-ax
Pter-o′-ta
Pter-o-zo′-nĭ-um
Pter-yg-oc′-al-yx
Pter-yg-o′-dĭ-um
pter-yg-os-per′-ma
Ptil-oc-ne′-ma*
Ptil-om′-er-is
Ptil-os-teph′-ĭ-um
Ptil-ot′-rich-um
Ptych-och-i′-lus
Ptych-os-per′-ma
pu′-bens
pu′-ber-a
pu-ber′-ul-a
pu′-bēs
pu-bes′-cens
pu-big′-er-a
Puc-ci′-nĭ-a
Puc-ci′-nĭ-ĕ-i
pud-ib-un′-dus
pud′-ic-a
Pu-er-a′-ri-a
Pug-ĭ-o-nel′-la
pug-ĭ-o-nif-or′-mis
pul-chel′-lum
pul′-cher
pul-cher′-rim-a
pul′-chrum
Pu-le′-gĭ-um
pul′-la
Pul-mo-na′-rĭ-a
Pul-sat-il′-la
Pul-ten-æ′-a
pul-ver′-ŭ-us
pul-ver-ul-en′-tum
pul-vi-na′-ris
pul-vi-na′-tum
pul-vi′-num
pu′-mil-a
Pu-mil′-ĭ-o
punc-ta′-ta
punc-ta-tis′-sim-um
punc-til-la′-ta
punc-til-ob′-ul-a
punc-tul-a′-tus
pun′-gens
Pu′-nic-a
pu-nic′-ĕ-a
pu-nic-if-ol′-ĭ-a
Pu-pal′-ĭ-a
Pur-die-a′-na
Pur′-die-i
pu′-re-um
Pur′-ga
pur-pur-a′-cĕ-a
pur-pur-as′-cens
pur-pur-a′-tum
pur-pur′-ĕ-a
pur-pur-ĕ-if-lo′-rum
Pur-sœ′-tha
Pursh′-ĭ-a
Pursh-ĭ-a′-na
Pusch-kin′-ĭ-a
pusch-kin-ĭ-ŏ-i′-dēs
pus-il′-lus
pus-tu-la′-ta
Pu-to′-rĭ-a
Put-ter-lick′-ĭ-a
Put-zeys′-ĭ-a′-na
Puy′-a
Puydt′-ĭ-i
pyc-nac-an′-tha
pyc-nan′-tha
pyc-noc-eph′-al-us
Pyc-nod-o′-rĭ-a
Pyc-nop′-ter-is
pyc-nop′-ter-um
pyc-nos-tach′-ŷ-a
Pyc-nos′-tach-ys
Py-gæ′-ra
pyg-mæ′-a
Pyl′-ĭ-um
Pyr-ac-an′-tha*
pyr-ac-an-thif-ol′-ĭ-a
Pyr-al-id′-in-a
Pyr′-al-is
Py-ram′-i
py-ram-id′-al-is
py-ram-id-a′-ta
pyr-a′-rĭ-a
Pyr-as′-ter
Py-re′-na*
pyr-en-æ′-us
pyr-en-a′-ic-a
Py-re-nom-yc-e′-tēs
Pyr-eth′-rum*
Pyr′-gus
Pyr′-i
pyr-ic′-ol-a
pyr-if-ol′-ĭ-a
pyr-if-or′-mis
pyr′-in-um
pyr-is′-ug-a
Pyr′-ol-a
pyr-ol-æ-fol′-ĭ-a
Pyr-ol-i′-rĭ-on
pyr-ol-ŏ-i′-dēs
Pyr-os-teg′-ĭ-a
pyr-roch′-rŏ-um
Pyr-rhei′-ma
Pyr-ul-a′-rĭ-a
Pyr′-us*
Py′-thĭ-on
Py′-thĭ-um
Py-tho′-nĭ-um
Pyx-id-an-the′-ra

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in *psā′-lmist*; ĕ as in *slĕn′-der*; ē as in *vē′-ined*; ĭ as in *thĭn*; ī as in *mach-ī′-nist*; ŏ as in *rŏt′-ten*; ō as in *vō′-ter*; ŭ as in *pow′-er-fŭl*; ū as in *rū′-ler*; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

pyx-id-a′-ta
pyx-id-it′-er-um
pyx-id-oph′-or-um

quad-ran-gul-a′-ris
quad-ran-gul-a′-ta
quad-ra′-ta
Qua′-drĭ-a
quad-rĭ-au-ri′-ta
quad-ric′-ol-or
quad-ric-or′-nis
quad-rid-en-ta′-ta
quad-rif′-id-us
quad-rif-ol′-ĭ-a
quad-rip-ar-ti′-ta
quad-riv-a′-vis
Qua′-lĕ-a
Qua′-moc-lit
Qua′-qua
Quar-tin′-ĭ-a
Quar-tin-ĭ-a′-nus
Quas′-si-a
Quek-et′-tĭ-a
Quel′-tĭ-a
quer-ce-tic′-ol-a
quer-cif-ol′-ĭ-a
quer-ci′-num
Quer′-cit-ron
Quer′-cus
Ques-nel′-ĭ-a
Ques-nel-ĭ-a′-na
Qui-hou′-i
Quil-la′-ja
Quil-la′-jĕ-æ
qui-na′-ta
quin′-quĕ-col-or
quin-quĕ-flo′-ra
quin-quĕ-fol′-ĭ-um
quin-quĕ-loc-ul-a′-ris
quin-quĕ-mac-ul-a′-tus
quin-quĕ-ner′-vĭ-a
quin-quĕ-punc-ta′-tus
quin-quĕ-vul′-ner-a
Quin-til′-ĭ-a
Quis-qua′-lis
qui-ten′-sĕ
Qui-vi′-sĭ-a
quæ-si′-ta

rac-e-mif-lo′-ra
rac-e-mo′-sus
rac-e-mul-o′-sa
rach-irh-i′-zon*
Rad-di-a′-num
Rad-em-ach′-ĭ-a
ra′-dens
rad-ĭ-a′-ta
ra-di′-cans*
ra-di-cic′-ol-a
ra-di-cip-er′-da
ra-di′-cum
rad-ĭ-if-lo′-rus
Rad′-ĭ-ol-a*
rad-ĭ-o′-sa
Ra′-dul-a
Ræg′-ner-ĭ-a′-na
Raff-les-ĭ-a′-na
Ra-fi-nes′-qui-i
Raf′-nĭ-a
Rag-am-ows′-kĭ-i
rag-us-i′-na
Rail-lar′-dĭ-a
Rai′-ner-i
Ra′-jah
Ra-ja′-nĭ-a
Ram-bu′-rĭ-i
ra-men-ta′-cĕ-a
ra-mif-lo′-ra
Ra-mond′-ĭ-a
ra-mond-ĭ-ŏ-i′-dēs
ra-mo′-sa
ra-mo-sis′-sim-um
ra-mo-sŏ-i′-dēs
Ram-til′-la
Ra-mul-a′-rĭ-a
ra-mul-o′-sa
ra′-næ
Ra-na′-rĭ-a
Ran-ca′-gua
Ran-dal′-ĭ-a
Rand′-ĭ-a
ran-gif-er-i′-na
ra-nif′-er-um
Ra-nun-cul-a′-cĕ-æ
ra-nun-cul-if-lo′-ra
ra-nun-cul-ŏ-i′-dēs
Ra-nun′-cul-us*
Ra′-pa
rap-a′-cĕ-um
ra′-pæ
Rap-a′-nĕ-a
Rap-a′-tĕ-a
Rap-a-tĕ-a′-cĕ-æ
Raph′-an-i
Raph-an-is′-trum
Raph′-an-us
Raph′-ĭ-a
raph-id-ac-an′-tha*
Raph-id-oph′-or-a
Raph-id-oph-yl′-lum
Raph-ĭ-ol′-ep-is
Raph-is-tem′-ma
ra-pun-cul-ŏ-i′-dēs
Ra-pun′-cul-us
Ra-pun′-tĭ-um
ra-rif-lo′-ra
ra′-rum
Ras-pail′-ĭ-a
Ras-pal′-ĭ-a
Rat-clif-fi-a′-na
Rath′-ĕ-a
Rath′-kĕ-a
Rat-ib′-id-a
Ra-to′-nĭ-a
rat′-tus
Ratz-eb-ur′-gi
rau′-cus
Rau-li′-nĭ-i
Rau-wolf′-ĭ-a
Rau-wolf′-ĭ-i
Rav-en-a′-la
Rav-en-e′-a
Rav-en′-ĭ-a
Rav-en′-næ
Rawes′-ĭ-i
Re-a′-li
Re-a′-na
Reau-mu′-rĭ-a
Reau-mu-rĭ-a′-cĕ-æ
Reb-ec′-cæ
rec-ep-ta′-cul-o′-rum
Rech-stein-er′-a
rec-li-na′-ta
rec′-ta
rec-ur′-va
rec-ur-va′-ta
rec-ur-vif-ol′-ĭ-um
rec-ut-i′-va
red-iv-i′-va
Red-out′-ĕ-a
Red-out′-ĕ-i
re-du-plic-a′-tum
Reed-ĭ-a′-num
Reeves′-i
Reeves′-ĭ-a
Reeves-ĭ-a′-na
ref-lex′-a
ref-rac′-tum
ref-ul′-gens
re-ga′-lis
Re-gel′-ĭ-a
Re-gel-ĭ-a′-num
Re-gel′-ĭ-i
reg-er′-min-ans
re′-gĭ-a
Re-gi′-na
Reg′-la
Reg-nel′-li
Reg-nel′-lĭ-i
Re-gni-e′-ri
Reh-man′-nĭ-a
Reich-ar′-di
Reich-ar′-dĭ-a
Reich-el′-ĭ-a
Reich-en-bach-ĭ-a′-na
Reich-en-bach′-ĭ-i
Reich-en-heim′-ĭ-i
Reid-el-ĭ-a′-na
Reid′-ĭ-a
Rein-eck′-e-a
Rein-eck′-ĭ-a
Rein-wardt′-ĭ-a
Rein-wardt′-ĭ-i
Rei-han′-ĭ-a
rel-ig-ĭ-o′-sum
rel-iq-ua′-na
Rem-ac′-lĕ-a
rem-o′-tum
Rem-u-sat′-ĭ-a
Re-nan-the′-ra
Ren′-da

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in slĕn′-der; ē as in v*ē′*-ined; ĭ as in thĭn; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Rend-at′-ler-i
Re-nealm′-ĭ-a
re-nif-or′-mis
Ren-sel-aer′-ĭ-a
rep-an′-dus
re′-pens
rep′-tans
Re-quien′-i
Re-quien′-ĭ-a
res-ec′-tum
Res-e′-da
Res-e-da′-cĕ-æ
re-si-na′-na
re-si-no′-sa
Res-tĭ-a′-cĕ-æ
Res′-tĭ-o
Res-trep′-ĭ-a
Re-ta′-ma
Re-ta-mil′-i-a
Re-ta-nil′-la
Ret-em-ey-er-a′-num
re-tic-ul-a′-ta
Re-tin-a′-rĭ-a
Re-tin′-ĭ-a
Re-ti-niph-yl′-lum
Re-ti-nos′-por-a
re-tor′-ta
re-tro-flex′-um
ret-u′-sa
Retz′-ĭ-a
Reu′-ter-i
rev-er′-sa
rev-ol-u′-tus
Rex
Rex′-ĭ-i
Rey-mon′-dĭ-i
Rhab-doc-rin′-um
Rhac-o′-ma
Rhad-in-oc-ar′-pus
Rha-go′-dĭ-a
Rham′-nĕ-æ
rham-nif-ol′-ĭ-a
rham-nŏ-i′-dēs
Rham′-nus
Rhaph-id-oph′-or-a*
Rhaph-ĭ-ol′-ep-is
Rhaph-ith-am′-nus
Rhap-id-oph-yl′-lum
Rhap′-is
Rha-pon′-tic-um
Rheed′-ĭ-a
Rheed′-ĭ-i
Rhe′-um
Rhex′-ĭ-a
Rhi-nac-an-tha′-cĕ-æ
Rhi-nac-an′-thus*
Rhi-nan-tha′-cĕ-æ
Rhi-nan′-thus
Rhi-nop-et′-al-um
Rhi-pid-od-en′-dron*
Rhi-pid-op′-ter-is
Rhi-pod-en′-dron
Rhi-pog′-on-um
Rhip′-sal-is
Rhi-zob-ĭ-i′-næ
Rhi-zob′-ĭ-us*
Rhi-zob-ol′-ĕ-æ
Rhi-zob′-ol-us
Rhi-zoc-ar′-pe-æ
Rhi-zog-lōs′-sum
Rhi-zom-or′-pha
Rhi-zoph′-or-a
Rhi-zoph-or′-ĕ-æ
rhi-zoph-yl′-lum
rhi-zoph′-yt-a
rhod-ac′-rum
Rhod-am′-nĭ-a
rhod-an-en′-sis
rhod-an′-tha
Rhod-an′-the
Rho-dĕ-a′-na
Rhod′-ĭ-ol-a
Rhod-i′-tēs
rhod-oc-en′-trum
rhod-och-i′-la
Rhod-och′-it-on
rhod-oc-inc′-ta
Rhod-oc-is′-tus
Rhod-oc′-om-a
Rhod-od-en′-dron*
Rhod-ol-ei′-a
Rhod-om-yr′-tus
rhod-on-eur′-um
rhod-op-en′-sis
rhod-oph-thal′-mus
rhod-op-leur′-on
rhod-op-ter-yg′-ĭ-um
Rhod-o′-ra
Rhod-orh-i′-za
Rhod-os′-path-a
Rhod-os′-tach-ys
Rhod-os′-tom-a
Rhod-oth-am′-nus
Rhod-ot′-yp-os
Rhœ′-as
Rho′-e-o
rho-if-lo′-ra
rhom′-bĕ-a
rhom-bif-ol′-ĭ-a
rhom-bŏ-i′-dal-is
rhom-bŏ-i′-dĕ-um
Rho′-pal-a
Rhop-al-oc′-er-a
Rhop-al-os′-iph-um
Rhop-al-os-tig′-ma
Rhop-al-os′-tyl-is
Rhu-ac-oph′-il-a
Rhūs
Rhyn-chad-e′-nĭ-a
Rhyn-chan-the′-ra
Rhyn-chi′-tēs
Rhyn-chog-lōs′-sum
Rhyn-chop-e′-ra
Rhyn-chop-et′-al-um
Rhyn-choph′-or-a
Rhyn-cho′-sĭ-a
Rhyn-chos-per′-mum
Rhyn-chos′-tyl-is
Rhyn-chot′-ech-um
Rhys-os-per′-mum
Rhyt-id-an′-dra*
Rhyt-id-oph-yl′-lum
Rhyt-ig-lōs′-sa
Rhyt-is′-ma
ri-bŏ-a′-na
Rĭ′-bēs
Ri-be′-sĭ-ŏ-æ
Ri-be′-sĭ-i
ri-bif-ol′-ĭ-a
Rĭ′-bis
Ric-car-dĭ-a′-nus
Ric-car-to′-ni
Ri-ce-a′-na
Rich-ard′-ĭ-a
Rich-ards′-i
Rich-ards-ĭ-a′-na
Rich-ards-o′-ni
Rich-ards-o′-nĭ-a
Rich′-ĕ-a
Rich′-ĕ-i
ric-in-if-ol′-ĭ-um
Ric′-in-us
Ri-co′-tĭ-a
Rid-olf-ĭ-a′-na
Rie′-del-ĭ-a′-num
Rig-id-el′-la
rig-id′-ul-um
rig′-id-um
Rĭ′-ma
rin′-gens
Rin′-go
Ri-oc-reux′-ĭ-a
ri-pa′-rĭ-um
Ri-pid′-ĭ-um
Rip-og′-on-um
Ritch-ie′-a
Ritch-ie-a′-na
Rĭ′-tro
Ri-um-in-ĭ-a′-na
ri-va′-le
Rĭ′-ve-a
Riv-i-e′-ra
Riv-i-e′-ri
Riv-i′-na
Riv-i-nĭ-a′-na
ri-vul-a′-ris
Ri-zo′-a
Ro-berg′-ĭ-a
Ro-ber-tĭ-a′-num
Rob-erts′-ĭ-a
Rob-erts′-ĭ-i
Rob-erts-o′-nĭ-a
Rob-in′-ĭ-a
rob-in-ĭ-æ-fol′-ĭ-um
Rob-in-so′-ni
Rob-in-so′-nĭ-a′-na
Rob-i-que′-tĭ-a
ro-bor-a′-ta
Ro′-bur
ro-bus′-tus
Roc-cel′-la
Ro′-chĕ-a
Ro-che′-lĭ-a
Ro-che-lĭ-a′-na
Ro-chen′-sis

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ro-dek-ĭ-a′-na
Rodg-ers′-ĭ-a
Rod-ĕ-æ′-i
Rod-i′-gas-i
Rod-i-gus-ĭ-a′-na
Rod-ri-gue′-zĭ-a
Ro-el′-la
Rœ-me′-rĭ-a
Rœ-me-rĭ-a′-na
Rœ′-per-a
Roes-le′-rĭ-a
Roes-te′-lĭ-a
Roez′-lĭ-a
Roez-lĭ-a′-na
Roez′-lĭ-i
Rof′-fĭ-a
Rog-ers′-ĭ-i
Ro-gi-e′-ra
Ro-gi-e′-ri
Ro-han′-ĭ-i
Roh′-dĕ-a
Rohr′-ĭ-a
Rohr′-ĭ-i
Ro-land′-ra
Rol-lis-o′-ni
Ro-ma′-na
*Ro-man-zof′-f*ĭ-a
Ro-man-zov-ĭ-a′-na
Ro-man-zov′-ĭ-i
*Ro-maz-of-f*ĭ-a′-na
Ro-me′-rĭ-a
Rom′-ney-a
Rom-ul-e′-a
Ron-del-e′-tĭ-a
Ronn-berg′-ĭ-a
Ron-now′-ĭ-a
Roop′-er-i
Rop′-al-a
Ros′-a*
ros-a′-cĕ-a
Ros-a′-cĕ-æ
Ros′-æ
ros-æ-flo′-ra
ros-æ-fol′-ĭ-us
ros-a′-na
Ro-san-ov′-ĭ-a
ros-a′-rĭ-a
Rosch-e′-rĭ-a
Ros-co′-e-a
Ros-co-e-a′-na
Ro′-sĕ-a
Ros′-ĕ-æ
Ros-eel′-sĭ-i
ros′-ĕ-us
ros-mar-ĭ′-nif-ol′-ĭ-a
ros-mar-i-nif-or′-mis
Ros-mar-ĭ′-nus
Ross′-ĭ-i
Ros-tel-la′-rĭ-a
ros-tel-la′-ta
ros-tra′-lis
ros′-trans
Ros-tra′-rĭ-a
ros-tra′-ta
ros-ul-a′-ris

Ro′-tang
rot-a′-tus
Roth-man′-nĭ-a
roth-om-ag-en′-sis
Roths-child′-ĭ-a-num
Rott-boel′-lĭ-a
Rott-le′-ra
rot-un-da′-tum
rot-un-dif-ol′-ĭ-a
rot-un′-dum
Rou-gi-e′-ri
Rou′-ham-on
Rou-lĭ′-nĭ-a
Rou′-pal-a
Rou-pel′-lĭ-a
Rou′-re-a
Rous-sæ-a′-cĕ-æ
Rox-burgh′-ĭ-a
Rox-burgh-ĭ-a′-cĕ-æ
Rox-burgh′-ĭ-i
Roy-e′-na
Roy-e′-ni
Roy′-lĕ-a
Roy-lĕ-a′-nus
Roy′-lĕ-ĭ
Rub′-ĕ-æ
rub-el′-la
rub′-ens
rub′-er*
rub-er′-rim-a
rub-es′-cens
Rub′-i
Rub′-ĭ-a
Rub-ĭ-a′-cĕ-æ
rub-ĭ-æ-fol′-ĭ-a
rub-ic-un′-da
rub′-id-a
rub-ĭ-el′-la
rub-if-lo′-ra
ru-bi-gin-o′-sa
Ru-bi-gin-o′-sa
ru-bi-go-ve′-ra
Rub′-i-I-dæ′-i
rub-ĭ-ŏ-i′-dēs
rub′-ra
rub-ric-au′-le
rub-rif-ol′-ĭ-a
rub-roc-inc′-tum
rub-ron-er′-vĭ-um
rub-ron-o-do′-sum
rub-ro′-rum
rub-rov-e′-nĭ-a
rub-rov-e-no′-sum
rub′-rum
Rub′-us*
Ruck′-er-i
Ruck-er-ĭ-a′-num
Ruck-er′-ĭ-i
Ruck′-ĭ-a
Rud-beck′-ĭ-a
Rud′-yĕ-a
rud′-is
Ru-dolph′-ĭ-a
Ru-dolph-œ-me′-rĭ-a
Ru-el′-lĭ-a

ru-el-lŏ-i′-dēs
ru′-fa
ru-fes′-cens
Ruf′-fĭ-a
ru-fic-ol′-lis
ru-fic-or′-nis
ru-fin-er′-vis
ru-fin′-ul-a
ru-foc-inc′-tus
ru′-ful-um
ru′-ga
ru-gil′-ob-us
ru-go′-sa
Ru-i′-zĭ-a
Ru-i-zĭ-a′-na
Ru′-lĕ-a
Ru′-lĕ-i
Ru-ling′-ĭ-a
Rum′-ex
Rum′-ic-is
Rum-phĭ-a′-na
Rum′-phĭ-i
run-ci-na′-tum
Ru-pal-ley′-a
ru-pes′-tre
ru-pic-ap-ra′-rĭ-a
ru-pic′-ol-a
Rup′-pĭ-a
Rup′-pĭ-i
Ru-prech′-tĭ-i
rus-cif-ol′-ĭ-a
Rus′-cus
Ru-si′-na
Rus-sel′-i-a
Rus-sel-lĭ-a′-na
Rus′-si
Rus′-su-la
rus′-tic-um
Ru′-ta
Ru-ta′-cĕ-æ
ru-tæ-fol′-ĭ-us
Ru′-ta-mu-ra′-rĭ-a
ruth-e′-nic-um
rut-id-ob-ul′-bon
rut′-il-ans
Ruysch′-ĭ-a
Ruysch-ĭ-a′-num
Ry-an′-ĭ-a
Ry-man′-dra
Rys-sop′-ter-ys
Ryt-id-ol-o′-ma
ryt-id-oph-yl′-la
Ryt-ig-in′-ĭ-a

Sab-ad-il′-la
Sa′-bal
Sab-ba′-tĭ-a
Sa′-bi-a
Sa-bi-a′-cĕ-æ
Sab-ic-e′-a
Sab-ĭ′-na
Sab-ĭ′-næ
Sab-ĭ′-ne-a

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Sab-i′-ni
Sab-i-nĭ-a′-nus
Sab-i′-nĭ-i
sab-i′-nŏ-i′-dēs
sac-ca′-ta
sac-char-a′-ta
sac-char-if′-er-a
sac-char′-in-um
Sac-char-om′-yc-ēs
Sac-char′-um
sac-cif′-er-a
Sac-coch-i′-lus
Sac-co-ĭ-a′-na
Sac-col-ab′-ĭ-um
Sac-col-o′-ma
sach-al-i-nen′-sŏ
Sac-og-lōt′-tis
Sad-ler′-ĭ-a
Sag-e′-nĭ-a
Sag-er-e′-tĭ-a
Sag-i′-na
sag-it-tæ-fol′-ĭ-a
sag-it-ta′-lis
Sag-it-ta′-rĭ-a
sag-it-ta′-ta
sag-it-tif-ol′-ĭ-a
Sag-li-o′-nis
Sa-go′-ne-a
Sa-græ′-a
Sa-gue′-rus
Sa′-gus
Sa-lac′-ca
sal-ac-cen′-sis
Sal-a′-cĭ-a
Sal-dan′-ha
Sal-ic-a′-rĭ-a
sal-ic-a′-rĭ-æ-fol′-ĭ-a
sal-ic-if-ol′-ĭ-a
sal-ic′-in-a
Sal-ic-in′-ĕ-æ
sal′-ic-is
Sal-ic-or′-nĭ-a
sal-ic-or-nŏ-i′-dēs
sal-ig′-na
Sa-lis-bu′-rĭ-a
Sa-lis′-ĭ-a
Sal′-ix
Sal′-mĕ-a
Sal′-mĭ-a
Sal′-mĭ-a′-na
Sal′-mĭ-i
Sal-pich-læ′-na
Sal-pich′-rŏ-a
Sal-pich-ro′-ma
Sal-pig-lōs′-sis
Sal-ping-an′-tha
Sal-pix-an′-tha
sal-sil′-la
Sal′-sol-a
Sal-sol-a′-cĕ-æ
sal-sol-ŏ-i′-dēs
sal-su-gin-o′-sus
sal′-sul-a
sal-ta-bun′-dum
sal-ta-to′-rĭ-a
sal-ta-to′-rum
Sal′-tic-us
Sal-va-do′-ra
Sal-va-do-ra′-cĕ-æ
Sal′-vĭ-a
Sal′-vĭ-æ
sal′-vĭ-æ-fol′-ĭ-us
sal-vif-ol′-ĭ-a
Sal-vi′-ni-a
Sal-vi′-ni-ĕ-æ
Salz-man′-ni
Sam′-ar-a
Sam′-bac
sam-bu-cif-ol′-ĭ-us
sam-bu′-cin-a
Sam-bu′-cus
Sam′-ĭ-a
Sa′-mol-us
Sa′-myd-a
Sa-myd-a′-cĕ-æ
San-che′-zĭ-a
San-co′-na
sanc′-ta
Sanc′-tæ Cath-er-i′-næ
San-dank′-wa
San-der-ĭ-a′-num
San-ders′-ĭ-i
San-der-so′-ni
San-der-so′-nĭ-a
Sand-ford′-ĭ-i
San-do′-ric-um
sand-vic-en′-sĕ
sand-wic-en′-sĕ
San-guin-a′-rĭ-a
san-guin′-ĕ-um
san-guin-ol-en′-tus
San-guis-or′-ba
San-guis-or-ba′-cĕ-æ
San-hil-a′-rĭ-a
San-sev-i-el′-la
San-sev-i-e′-ra
San-tal-a′-cĕ-æ
San′-tal-um
San-tol-i′-na
san-tol-i-nŏ-i′-dēs
San-vi-ta′-lĭ-a
Sap′-an
Sa-per′-da
sap′-id-a
sap-ĭ-en′-tum
Sap-in-da′-cĕ-æ
Sap-in′-dĕ-æ
Sap-in′-dus
Sap′-ĭ-um
sap-o-na′-cĕ-um
Sap-o-na′-rĭ-a
Sap-osch-ni′-kow-i
Sap-o′-ta
Sap-o-ta′-cĕ-æ
Sap′-pan
sapph-i′-rin-a
Sap-rol-eg′-nĭ-a
Sar-a′-ca
Sa-ra′-cha
Sar-can′-thus
Sar-cin′-ul-a
Sar-cin′-ul-æ
Sar-coc-ap′-nos
Sar-coc-ar′-pon
Sar-coc-au′-lon
Sar-coc-eph′-al-us
Sar-coch-i′-lus
Sar-coc-oc′-ca
Sar-coc-ol′-la
sar-co′-dēs
Sar-cog-lōt′-tis
Sar-cog′-on-um
Sar-col′-ob-us
Sar-coph-yl′-lus
Sar-cop-od′-ĭ-um
Sar-cop′-tēs
Sar-cos-tem′-ma
Sar-i′-bus
sar-mat′-ic-a
sar-men-ta′-cĕ-a
sar-men-to′-sum
Sar-mi-en′-ta
sar-nĭ-en′-sis
Sar-o′-tēs
Sar-o′-thra
Sar-rac-e′-nĭ-a
Sar-rac-e-nĭ-a′-cĕ-æ
Sar-sap-ar-il′-la
Sar-to′-rĭ-i
Sas-an′-qua
Sas′-saf-ras
sat-i′-va
Sat-ur-e′-ĭ-a
sat-ur-e′-ĭ-ŏ-i′-dēs
Sa-tur′-nĭ-a
Sat-yr′-ĭ-um
Sat-zu′-mi
Saun-ders′-ĭ-a
Saun-ders-ĭ-a′-næ
Saun-ders′-ĭ-i
Sau-rau′-ja
sau-roc-eph′-al-a
Sau-rog-lōs′-sum
Sau-rom′-at-um
Sau′-rop-ūs
Sau-ru′-rĕ-æ
Sau-ru′-rus
Saus-su′-rĕ-a
Saus-su′-rĭ-a
Sau′-ter-i
Sau-va-ge′-sĭ-a
Sau-va-ge′-sĭ-ĕ-æ
Sav-as-ta′-na
Sav-il-ĕ-a′-na
sax-a′-til-is
Saxe-goth′-ĕ-a
sax-ic′-ol-a
Sax-if′-rag-a*
Sax-if-rag′-ĕ-æ
Sax-of-rid-er-i′-cĭ-a
sca′-ber
scab-er′-ul-a
scab′-ĭ-ei
scab′-ĭ-ēs
Scab-ĭ-o′-sa

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *good*, c in *muscular*, and ch in *Christian*. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

scab-ĭ-o-sæ-fol′-ĭ-a
scab-ĭ-o-sō-ĭ′-dēs
scab′-ra
scab-rel′-la
scab′-rid-a
scab-rif-ol′-ĭ-a
scab-ril-in′-gue
scab-ris-ca′-pa
scab-rĭ-us′-cul-a
Scæ′-vol-a
sca-la′-ris
Scăl′-ĭ-a
Scam-mo′-nĭ-a
scan′-dens
scan′-dic-a
scaph′-a*
scaph-ig′-er-a
Scaph-yg-lōt′-tis
sca-po′-sus
scar-ĭ-o′-sum
scar-lat-i′-nus
Scel-och-ĭ′-lus
Scep-a′-cĕ-æ
Scep-as′-ma
Scĕp-tran′-thus
scĕp′-trum
Schacht′-ĭ-i
Schæf-fer′-ĭ-a
Schaff-ner′-ĭ-a
Schat′-ta
Schau-er′-ĭ-a
Schau-er-ĭ-a′-na
Sched-on′-or-us
Schee′-lĕ-a
Schee′-rĭ-a
Schee′-rĭ-i
Schef′-fer-i
Schel-ham′-mer-a
Schel-lol′-ep-is
Schel-ve′-rĭ-a
Scher-em-e′-tiew-i
Scher-zer-ĭ-a′-num
Scheuch-ze′-ri
Scheuch-ze′-rĭ-a
schid-ig′-er-a
Schid-os-per′-mum
Schie-dĕ-a′-num
Schie′-dĕ-i
Schil-ler-ĭ-a′-num
Schi′-ma
Schim-pe′-ri
Schi′-nus
Schis-mat-og-lōt′-tis
Schis′-mus
Schi-ver-eck′-ĭ-a
Schiz-æ′-a
Schiz-an′-dra
Schiz-an′-drĕ-æ
schiz-anth′-a
Schiz-anth′-ēs
Schiz-anth′-us
Schiz-ob′-as-is
Schiz-oc-æ′-na
Schiz-oc-ap′-sa
Schiz-oc-en′-tron
Schiz-o′-dĭ-um
schiz′-od-on
Schiz-ol-ob′-ĭ-um
Schiz-ol-o′-ma
Schiz-om-er′-ĭ-a
Schiz-om-yc-et′-ēs
Schiz-on-eu′-ra
Schiz-op-et′-al-on
schiz-op-et′-al-um
Schiz-oph-rag′-ma
schiz-oph-yl′-la
Schiz-op-leu′-ra
Schiz-op′-ter-is
Schiz-os-tem′-ma
Schiz-os′-tyl-is
Schkuhr′-ĭ-a
Schkuhr′-ĭ-i
Schleich′-er-i
Schleid-en-ĭ-a′-na
Schliep-er-ĭ-a′-num
Schlim′-ĭ-i
Schlim′-mĭ-a
Schlum-ber-ger′-ĭ-a
Schlum-ber-ger-ĭ-a′-na
Schmid-el′-ĭ-a
Schmidt-ĭ-a′-na
Schmidt′-ĭ-i
Schmitz′-ĭ-i
Schnitt-spahn′-i
Schoel′-ler-i
Schœn-an′-thus
Schœn′-ĭ-a
Schœn-op′-ras-um*
Schœn-or′-chis
Schœn′-us
Schœp′-fĭ-a
Scho-field′-ĭ-i
schol-a′-ris
Schol′-ler-a
Schol′-lĭ-a
Schom-burgh′-ĭ-i
Schom-burgk′-ĭ-a
Schom-burgk-ĭ-a′-nus
Schom-burgk′-ĭ-i
Scho′-tĭ-a
Schot-tĭ-a′-na
Schot′-tĭ-i
Schous-bœ′-a
Schouw′-ĭ-a
Schra′-der-a
Schranck′-ĭ-a
Schrank′-ĭ-i
Schre′-ber-a
Schrenk′-i
Schrenk-ĭ-a′-na
Schrö′-der-æ
Schrö-der-ĭ-a′-na
Schrœ′-der-i
Schrœ-der-ĭ-a′-num
Schu-ber′-tĭ-a
Schul-te′-sĭ-a
Schultz′-ĭ-i
Schwœ-gri-che′-nĭ-a
Schwan′-nĭ-a
Schwartz′-ĭ-a
Schwed′-ler-i
Schweig-ger′-ĭ-a
Schwenk-feld′-a
Schwenk′-ĭ-a
Schwerd′-ler-i
Schweyck-ert′-a
Scĭ-ad-oc′-al-yx*
Scĭ-ad-oph-yl′-lum
Sci-ad-op′-it-ys
Scĭ-aph′-il-a
Scil′-la
scil-la′-ris
scil-lĭ-i′-dēs
Scin-dap′-sus
scin-til′-lans
Scĭ-od-aph-yl′-lum
Scĭ-oph-yl′-la
Scir′-pĕ-æ
Scir′-pus
Sci-ta-min′-ĕ-æ
Scĭ-u′-ris
Scla′-rĕ-a
Scle-ran′-thus*
Scle′-rĭ-a
scle-roc-ar′-pa
Scle-ron-e′-ma
scle-roph-yl′-la
Scle-rop′-ter-is
Scle-roth-am′-nus
Scle-ro-tin′-ĭ-a
scle-ro-tĭ-o′-rum
scle-ro′-tĭ-um
Scle-rox′-yl-on
Scol-ĭ-os-o′-rus
Sco-loch′-lŏ-a
Scol-op-en′-dra
scol-op-en-drif-ol′-ĭ-um
scol-op-en-drĭ′-na
Scol-op-en′-drĭ-um
Scol′-ym-us
Sco-lyt′-id-æ
Sco′-lyt-us
Sco′-pa
sco′-pæ
Sco-pa′-rĭ-a
Scop-o′-lĭ-a
Scop-o-lĭ′-na
scop-ul-i′-na
Scor′-dĭ-um
Sco′-rĭ-as
Scor-od-o′-nĭ-a
Scor-od-op′-ras-um
scor-pĭ-ŏ-i′-dēs
Scor-pĭ-u′-rus
Scor-zon-e′-ra
scor-zon-e-ræ-fol′-ĭ-a
scor-zon-e-rif-ol′-ĭ-um
sco′-tic-a
Scot′-tĕ-a
Scot-tĭ-a′-na
Scou′-ler-i
Scroph-ul-a′-rĭ-a
scroph-ul-a-rĭ-æ-fol′-ĭ-us
Scroph-ul-ar-in′-ĕ-æ
sculp′-tum

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ȳ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in h*ou*se; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

scur′-ra
Scu-tel-la′-rĭ-a
scu-tel-la-rĭ-ŏ-ĭ′-dēs
scu-tel-la′-ris
scu-tel-la′-ta
Scu-tic-a′-rĭ-a
scu-tif-ol′-ĭ-a
Scut′-ul-a
scu′-tum
Scyph-an′-thus
Scyph-ul-a′-rĭ-a
Scyt-al′-ĭ-a
Scyt′-al-is
Scy-tan′-thus
*Sea-forth′-*ĭ-a
*Se-bæ′-*a
*Se-ba′-*na
Se-bes-te′-na
se-bif′-er-a
Sec-a′-le*
Se′-cal-is
Sec-am-o′-ne
*se-chel-la′-*rum
Se′-chĭ-um
sec-un′-da
sec-un-dif-lo′-rum
Sec-u-ri-da′-ca
sec-u′-rig-er
Sec-u-rig′-er-a
Sec-u-rin′-eg-a
*Sed-e′-*ni
*Sed-e-nĭ-a′-*na
Sed′-um*
See-man′-ni
*See-man′-nĭ-*a
*See-man′-nĭ-a′-*nus
*Seg′-eth-*i
seg-et′-um
*Seg-ui-e′-rĭ-*i
Seg-ui′-ne
Sel-ag-in′-ĕ-æ
Sel-a-gin-el′-la
Sel-a-gin-el′-lĕ-æ
sel-a-gin-ŏ-ĭ′-dēs
Sel-a′-go
Sel-an′-drĭ-a
Sel-a′-tĭ-um
*Sel-born-en′-*sis
Sel-e′-nĭ-a
Sel-e-nip-ed′-ĭ-um
Sel-i′-num
*Sel-kirk′-*ĭ-i
sel-lig′-er-um
*Sel-li′-guĕ-*a
*Sel-lo′-*a
*Sel-lo′-*um
*Sel-lo-vĭ-a′-*na
*Sel-lo-wĭ-a′-*num
*Sel-o′-sĭ-*i
*Sel-sky-a′-*num
*Se-man′-*ĭ-i
Se-me-car′-pus
Se-mei-an′-dra
Sem′-el-e
*Se-men-o′-vĭ-*i
*Sem-en-ow′-*ĭ-i
se-mĭ-a-la′-ta*
se-mic-lau′-sa
se-mic-or-da′-tum
se-mic-yl-in′-dric-a
se-mid-ec-an′-drum
se-mig-al-ĕ-a′-tum
se-mil-ac′-er-um
se-mip-in-na′-ta
se-mis-er-ra′-ta
sem-per-flo′-rens
sem-per-vir′-ens
sem-per-vi-vŏ-ĭ′-dēs
Sem-per-vi′-vum
*Se-na′-*cĭ-a
sen-ec-ĭ-if-ol′-ĭ-a
Sen-ec-il′-lis
Sen-ec′-ĭ-o*
sen-ec-ĭ-ŏ-ĭ′-dēs
Sen-ec-ĭ-o′-nis
Sen′-eg-a
Sen′-eg-al
*sen-eg-al-*en′-sis
sen-i′-le
sen-sib′-il-is
sen-sit-i′-va
se-pĭ-a′-rĭ-a
se-pin′-col-a
se′-pĭ-um
sep-tang-ul-a′-re
Sep′-tas
sep-tem′-fid-a
sep-tem′-lob-um
sep-tem-punc-ta′-ta
sep-ten-tri-o-na′-le
Sep-to′-rĭ-a
sep-ul′-tum
Seq-uoi′-a
Ser-an-gi′-um
Se-raph′-yt-a
Ser-ap′-ĭ-as
*serb′-*ic-a
*Ser-e-no′-*a
Ser-ĭ-a′-na
se-ric′-ĕ-a
Se-ric-oc-ar′-pus
Se-ric-og′-raph-is
*Ser-ing′-*ĭ-a
Ser-i′-phĭ-um
Ser-is′-sa
*Ser-ja′-*nĭ-a
*ser-jan′-*ĭ-æ-fol′-ĭ-a
*Ser′-*lĭ-i
se-ro′-tin-us
ser′-pens
Ser-pen-ta′-rĭ-a
ser-pen-ti′-nus
Ser-pic′-ul-a
ser-pyl-lif-ol′-ĭ-um
Ser-pyl-lop′-sis
Ser-pyl′-lum
ser′-ra
ser-ra′-ta
ser-ra-tif-ol′-ĭ-a
Ser-ra′-tul-a
ser-rul-a′-ta
*Ser-ru′-*rĭ-a
*Ser-ru′-rĭ-*æ
*Ser-sal-i′-sĭ-*a
Ser-tif′-er-a
se-sam-ŏ-i′-dēs
Se′-sam-um
*Ses-ban′-*ĭ-a
Ses′-el-i
Se′-sĭ-a
*Ses-le′-rĭ-*a
ses-quip-ed-a′-lis
ses-sif-ol′-ĭ-um
ses-sil-if-lo′-ra
ses-sil-if-ol′-ĭ-us
ses′-sil-is
Ses-u′-vĭ-um
se-ta′-cĕ-a*
Se-ta′-rĭ-a
*Seth′-*ĭ-a
se-tif-ol′-ĭ-um
se-tig′-er-a
se-to′-sa
se-tul-if′-er-um
se-tul-o′-sum
sev-e′-ra
*Sev-er-i′-nĭ-*a
*Sew-er-zow′-*i
*Sew-er-zow′-*ĭ-a
*Sey-me′-rĭ-*a
*Sey-mour′-*ĭ-a
Shal′-lon
*Shan-non-*ĭ-a′-na
*Shaw′-*ĭ-i
*Shay-lock′-*ĭ-i
*Shep-herd′-*i
*Shep-herd′-*ĭ-a
*Shep-herd′-*ĭ-i
*Shep′-pard-*i
*Sher-rat-tĭ-a′-*na
*Short′-*ĭ-i
*Shu-ter-*ei′-a
*Shuttle-worth′-*ĭ-i
*si-am-*en′-sis
*Sib-bald′-*ĭ-a
*Sib-bald-*ĭ-æ-fol′-i-a
*Sib-i-ræ′-*a
*sib-i′-ric-*a
*Sib-thorp′-*ĭ-a
*Sib-thorp′-*ĭ-i
Sic-el′-ĭ-um
sic′-ul-a
Sic-ŷ-oc-ar′-pus
sic-ŷ-ŏ-ĭ′-dēs
Sic′-ŷ-os
Si′-da
Si-dal′-cĕ-a
Sid-e-ri′-tis*
Sid-e-rod-en′-dron
sid-e-rox-yl-ŏ-i′-dēs
Sid-e-rox′-yl-on
si-dŏ-i′-dēs
*Sie′-ber-*a
*Sie′-ber-*i
*Sie-ber′-*ĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in ps*ā′*-lmist; č as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Sie-bold'-i
Sie-bold-ĭ-a'-na
Sie-bold'-ĭ-i
Sie-ges-beck'-ĭ-a
Sie-vers'-ĭ-a
Sie-vers'-ĭ-i
Sig-il-la'-rĭ-a
Sig-mat-os'-tal-yx
sig-na'-ta
sik-kim-en'-sis
si-la'-if-ol'-ĭ-a
Si-la'-us
Si-le'-ne
si-le'-nŏ-i'-dēs
Si-le-nop'-sis
Sil-ic-ul-o'-sa
Sil'-ĭ-qua
Sil-ĭ-quas'-trum
Sil-ĭ-quo'-sa
Sil'-pha
Sil'-phĭ-um
sil-va'-tic-a
Sil'-yb-um
Sim-a'-ba
Sim-ar-ou'-ba
Sim-ar-u'-ba
Sim-ar-u'-bĕ-æ
Sim-e'-this
Sim-monds'-ĭ-a
Si-mo'-nĭ-i
Sim-ons'-ĭ-i
sim'-plex
sim-plic-ic-au'-lis
sim-plic-if-ol'-ĭ-a
Sim-plic-if-ol'-ĭ-æ
sim-plic'-if-rons
sim-plic-is'-sim-um
Simp'-son-i
Sims'-ĭ-i
sim'-ul-a
sim'-ul-ans
Sin-a'-pis
Sin-clair'-ĭ-a
sin-em-a-ri-en'-sis
sin-en'-sis
sing-ap-o-ren'-sis
sin'-ic-um
Sin-ning'-ĭ-a
sin-u-a'-ta
sin-u-o'-sum
Siph'-o*
Siph-oc-am'-pyl-os*
Siph-on-an'-dra
Siph-on-an'-tha
Siph-o'-nĭ-a
Siph-o-nĭ-op'-sis
Siph-o-noph'-or-a
sip-yl-e'-um
Si'-rex
Si'-ri-um
Sir-ot'-sik
Sis'-ar-um
Sis'-soo
sis-ym-brĭ-if-ol'-ĭ-um
Sis-ym'-brĭ-um
Sis-yr-in'-chĭ-um
sit-chen'-sis
Si-toc-o'-dĭ-um*
Si-to'-dĭ-um
Si-tol-ob'-ĭ-um
Si-to'-na
Si'-um
Skim'-mi-a
Skin'-ner-i
Skin-ner'-ĭ-a
Skĭ-oph'-il-a
Sla-ter'-ĭ-a
Sloa'-ne-a
smar-ag'-din-a
Smeath-man'-nĭ-a
Smee-a'-na
Smĕg-mad-er'-mos
Sme-rin'-thus
Smi-la'-cĕ-æ
smi-lac-if-ol'-ĭ-a
Smi-lac'-in-a
Smi'-lax
Smith'-ĭ-a
Smith-ĭ-a'-na
Smith'-ĭ-i
Smyr'-nĭ-um
sob-ol-if'-er-a
Sob-ral'-ĭ-a
soc-ĭ-a'-lis
soc-ot-ra'-na
So-crat-e'-a
So-di'-ro-i
So'-ja
So-la-na'-cĕ-æ
Sol-an'-der-i
So-lan'-dra
So-lan'-dri
*so-lan-dri*f-lo'-rum
so-la-nŏ-i'-dēs
So-la'-num
so-la'-re
Sol-a'-rĭ-a
Sol-dan-el'-la
sol-dan-el'-læ-flo'-ra
So'-lĕ-a
So-le'-na*
So-le-nach'-ne
So-le-nan'-dra
So-le-nan'-tha
So-le-nan'-thus
So-le-nid'-ĭ-um
So-le-nom'-el-us
So-le-noph'-or-a
So-le-nop'-sis
sol'-id-a
sol-id-a-gin'-ĕ-us
Sol-id-a'-go
so-lit-a'-rĭ-a
Sol'-ly-a
Som-mer-feldt'-ĭ-a
som-nic-ul-en'-tum
som-nif'-er-um
sonch-if-ol'-ĭ-a
sonch-ŏ-i'-dēs
Sonch'-us
Son-er-i'-la
Son-ner-a'-tĭ-a
son-o'-ra
Soph'-ĭ-a*
Soph'-or-a
soph-or-æ-fol'-ĭ-a
soph-or-ŏ-i'-dēs
Soph-ron-an'-the
Soph-ron-i'-tis
Sop-u'-bi-a
So-ran'-the
Sor-ba'-rĭ-a
sor-bif-ol'-ĭ-um
Sor'-bus
sor'-did-a
So-re'-ma
Sor'-ghum
Sor-in-dei'-a
So-roc-eph'-al-us*
So-rom'-an-ēs
sor-o'-rĭ-um
so-ros-por-ĭ-ŏ-i'-dēs
So-ros-por'-ĭ-um
Sou-a'-ri
Sou-lan-ge-a'-na
Sou-lan'-gĭ-a
Sou-rou-be'-a
South-well'-ĭ-a
Sou'-za
Sow-er-bæ'-a
Sow-er'-bĭ-i
spa-di'-cĕ-um
Spa-dos'-tyl-ēs
Spar-ax'-is
Spar-gan'-ĭ-um
Spar-man'-nĭ-a
spar'-sa
spar-sif-lo'-ra
spar-sif-ol'-ĭ-a
spar'-tĕ-a
Spar-tĭ-an'-thus
Spar-ti'-na
spar-tĭ-ŏ-i'-dēs
Spar'-tĭ-um
Spar-toth-am'-nus
Spar'-tum
Spat-al-an'-thus
Spat-al'-la
Spat-an'-thus
spath-a'-cĕ-a*
Spath-an'-thĕ-um
Spath-eg-as'-tēr
Spath-e'-lĭ-a
Spath-ic-ar'-pa
Spath-iph-yl'-lum
Spath'-ĭ-um
Spath-o'-dē-a
Spath-og-lōt'-tis
Spath-*ot-ec-o'-ma*
spath-ul-a'-tum
spath-ul-if-ol'-ĭ-um
spath-ul-i'-num
Spath-y-e'-ma
Spat-ul-a'-rĭ-a
spec-ĭ-o'-sa

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art'; ā as in psā'-lmist; ĕ as in slĕn'-der; ē as in vē'-ined; ĭ as in thĭn; ī as in mach-ī'-nist; ŏ as in rŏt'-ten; ō as in vō'-ter; ŭ as in pow'-er-fŭl; ū as in rū'-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

spec-ĭ-o-sis′-sim-a
Speck-li′-nĭ-a
spec-ta′-bil-is
spec-tan′-dum
spec-tril-in′-guis
spec′-trum
Spec-ul-a′-rĭ-a
spec-ul-a′-trix
Spec′-ul-um
Speir-an′-tha
Spel′-ta
spe-lun′-cæ
Spen-cer-ĭ-a′-na
Sper′-gul-a
Sper-gul-as′-trum
Sper-ling′-ĭ-a
Sper-mac-o′-ce*
Sper-mad-ic′-ty-on
Sper-max′-yr-um
sphac-el-a′-tum
Sphac′-el-e
Sphac-el′-ĭ-a
Sphær-al′-cĕ-a
Sphær-el′-la
Sphær′-ĭ-a
Sphær-ĭ-a′-cĕ-æ
sphær′-ic-a
Sphær-oc-ar′-pus
Sphær-oc-ar′-ŷ-a
sphær-oc-eph′-al-us
Sphær-och′-lŏ-a
Sphær-oc-ĭ-on′-ĭ-um
Sphær-og′-yn-e
sphær-ŏ-i′-dĕ-a
Sphær-ol-ob′-ĭ-um
Sphær-o′-ma
Sphær-oph′-or-a
Sphær-oph-y′-sa
Sphær-op-sid′-ĕ-æ
Sphær-op′-sis
Sphær-op′-ter-is
sphær-os-tach′-ŷ-um
Sphær-os-te′-ma
Sphær-os-teph′-an-os
Sphær-os-tig′-ma
Sphær-oth-e′-ca
Sphær-oth-e′-le*
Sphag-na′-cĕ-æ
Sphag′-num
Sphe-nan′-dra*
Sphe-nod-es′-ma
Sphe-nog′-yn-e
Sphe-not′-om-a
Sphing′-id-æ
Sphing-i′-na
Sphinx
sphon-dyl′-ĭ-um
spi′-ca
Spi′-cant
spi-ca′-ta
Spi-cer-ĭ-a′-num
spi-cig′-er-a
Spi-cil-la′-rĭ-a
Spiel-man′-nĭ-a
Spi-gel′-ĭ-a
Spi-lan′-thēs*
Spi-lan′-thus
Spi-loc-æ′-a
Spi-lon-o′-ta
spi-lop′-ter-um
Spi-los-o′-ma
spi′-na-Chris′-ti
Spi-na′-cĭ-a
spi-na′-rum
Spi′-nif-ex
spi-no′-sa
spi-no-sis′-sim-us
spi-nul-if′-er-a
spi-nul-o′-sum
Spi-ræ′-a*
Spi-ræ′-ĕ-æ
spi-ra′-lis
Spi-ran-the′-ra
Spi-ran′-thēs
spi-ran-thĕ-i′-dēs
Spi-ra′-rĭ-a
spi-rel′-la
Spi-rid′-ĭ-um
Spi-roc-o′-nus
Spi-ron-e′-ma
Spi-ros-te′-mŏn
Spith-am-æ′-us
Spix-ĭ-a′-na
splach-nic-ar′-pa
splen′-dens
splen′-did-a
splen-did-is′-sim-um
Spof-forth-ĭ-a′-na
Spon′-dĭ-as
spond-ĭ-ŏ-i′-dēs
Spon-dyl-oc-oc′-ca
Spon-ti′-ni
spor-ad-oc-ar′-pum*
Spor-id-es′-mĭ-um
Spor-ob′-ol-us
Spra′-gue-a
Sprek-el′-ĭ-a
Spreng-el′-ĭ-a
Spreng-el′-ĭ-i
spreng-el-ĭ-ŏ-i′-dēs
Spring′-ĭ-a
Spru-cĕ-a′-num
Spru′-cĕ-i
spu-ma′-rĭ-a
spur′-ĭ-a
spu-ta′-tor
Spyr-id′-ĭ-um
squa′-leus
squa′-lid-a
squa-ma′-ta
Squa-mat-ax′-us
squa′-mĕ-a
squa-mif′-er-a
squa-mo′-sa
squa-mul-o′-sum
squar-ro′-sa
Squil′-la
Staav′-ĭ-a
Stach-ŷ-op-o′-gŏn*
Stach′-ys
Stach-yt-ar′-pha
Stach-yt-ar-phe′-ta
Stach-ŷ-u′-rus
Stack-hous′-ĭ-a
Stack-hous′-ĭ-ĕ-æ
Stæh-el-ĭ′-na
Stag-on-os′-por-a
Stal-ag-mi′-tēs
Stam-ford-ĭ-a′-num
sta-min′-ĕ-a
Stand-ish′-ĭ-i
Stang-ĕ-a′-na
Stang-er′-ĭ-a
Stan-ho′-pĕ-a
Stan-ho′-pĕ-as′-trum
*Stan′-ley-a**
Stan-ley-a′-na
Stan′-nĭ-a
stans
Stans-field′-ĭ-i
Sta-pel′-ĭ-a
Sta-pel′-ĭ-æ
sta-pel-ĭ-æ-for′-mis
sta-pel-ĭ-ŏ-i′-dēs
Staph-id-ĭ-as′-trum
Staph-id′-ĭ-um
Staph-yl-e′-a*
Staph-yl-e′-æ
staph-yl-e-ŏ-i′-dēs
Staph-yl-i′-nid-æ
Staph-yl-i′-nus
Staph-ys-ag′-rĭ-a
Star′-kĕ-a
Stat′-ic-e
stat-ic-if-ol′-ĭ-us
Staun-to′-nĭ-a
staur-ac-an′-tha
Staur-ac-an′-thus
Staur-an-the′-ra
Staur-i′-tis
Staur-og-lōt′-tis
staur-oph-yl′-lum
Staur-op′-sis
Staur-os-tig′-ma
Steel′-ĭ-i
Steen-ham′-mer-a
Steetz-ĭ-a′-na
Steg-nog-ram′-me
steg-nog-ram-mŏ-i′-dēs
Steg-o′-sĭ-a
Stei-ger-ĭ-a′-na
Stein′-ĭ-i
Stel-eph-u′-ros
Stel′-is
stel′-la
Stel-la′-rĭ-a
stel-la′-ris
stel-la′-ta
stel-la-ta′-rum
stel-la-tif-ol′-ĭ-um
Stel-le′-ra
Stel-le′-ri
Stel-le-rĭ-a′-na
stel-lig′-er-um
stel-lul-a′-tum

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp-art′*; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ŷ as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Steltz′-ner-i
Stem-ma′-rĭ-a
Stem-mat′-ĭ-um
Ste-mo′-dĭ-a*
Ste′-mon-a
Ste-mon-ac-an′-thus
Sten-ac′-tĭs
Sten-an′-drĭ-um
Sten-an-the′-ra
Sten-an′-thĭ-um
Sten′-ĭ-a
Sten-oc-ar′-pus*
sten-oc-eph′-al-a
sten-och-i′-lum
Sten-och-i′-lus
Sten-och-læ′-na
Sten-oc-or′-yn-e
Sten-og-as′-ter
Sten-og-as′-tra
Sten-og-lōs′-sum
Sten-og-lōt′-tis
sten-og′-yn-e
Sten-ol-o′-ma
Sten-om-es′-son
sten-op-et′-al-a
sten-oph-yl′-lum
Sten-op′-ter-a
Sten-orh-yn′-chus
Sten-os-e′-mĭ-a
sten-os-ep′-al-us
Sten-os-o-le′-nĭ-um
Sten-os-per-mat′-ĭ-on
Sten-os-te′-mum
Sten-os′-tom-um
Sten-ot-aph′-rum
Steph-an-an′-dra*
Steph-a′-nĭ-a
Steph-an′-ĭ-um
Steph-an-oc′-om-a
Steph-an-ol-i′-rĭ-on
Steph-an-om-er′-ĭ-a
Steph-an-oph′-or-um
Steph-an-oph-y′-sum
Steph-an-o′-tis
Ster-cor-a′-rĭ-um
Ster-cul′-ĭ-a
Ster-cul-ĭ-a′-cĕ-æ
Ster-cul′-ĭ-ĕ-æ
Ster-ĕ-os-an′-dra
Ster-ĕ-ox′-yl-on
Ster′-ĕ-u-um
Ste-rig′-ma
Ste-rig-mos-te′-mŏn
ster′-il-is
Ster-iph-o′-ma
Ste′-ris
Stern-berg′-ĭ-a
Stern-berg′-ĭ-i
Steud-el′-ĭ-a
Steud′-ner-a
Ste-ve′-nĭ-a
Ste-ve′-nĭ-i
Ste-ven′-sĭ-i
Ste-ven-so′-nĭ-a
Ste′-vĭ-a
Stew-art′-ĭ-a
Stew-art′-ĭ-i
Stib-a′-sĭ-a
Stich-on-eu′-ron
Stick-man′-nĭ-a
Stifft′-ĭ-a
Stig-maph-yl′-lon
Stig-mar-o′-ta
stig-mat′-ic-um
stig-mo′-sum
Stil-ag-in′-ĕ-æ
stil-a′-ta
Stil′-bĕ-æ
Stil-ling-flee′-tĭ-a
Stil-ling′-ĭ-a
Sti′-pa
sti-pit-a′-tum*
stip-ul-a′-cĕ-a
stip-ul-a′-ris
stip-ul-a′-ta
Stir-ling′-ĭ-i
Stiz-ol-ob′-ĭ-um
Stob-æ′-a
Stob-art-ĭ-a′-na
Stock′-ĭ-i
stœch′-ad-is
Stœch′-as
*Stokes′-ĭ-a**
stol-o-nif′-er-a
Sto′-nĕ-i
Storck′-ĭ-i
Stor-i-e′-ri
Sto′-ry-i
Strach′-ey-i
stra-min′-ĕ-a
stra′-min-is
Stram-o′-nĭ-um
Strān′-gĕ-a
stran-gul-a′-ta
Strang-ways′-ĭ-i
Stran-væ′-sĭ-a
Strat-ĭ-o′-tēs
Strav-a′-dĭ-um
Streb-lan-the′-ra
Streb-lorh-i′-za
Streb′-lus
Strel-itz′-ĭ-a
Strep′-sĭ-a
Strep-tan-the′-ra
Strep-tan′-thus
Strep′-tĭ-um
Strep-toc-ar′-pus
strep-top-et′-al-a
strep-toph-yl′-la
Strep′-top-us
Strep-tos-o′-lēn
stri-æ-for′-mis
strĭ-a-tel′-lum
strĭ-a′-tul-um
strĭ-a′-tum
stric′-ta
stric-tif-lo′-ra
Strig-il′-ĭ-a
strig-il-lo′-sa
strig-o′-sa
strig-ul-o′-sum
strĭ-ol′-a
strĭ-ol-a′-tus
Strob′-il-a*
strob-il-a′-cĕ-a
Strob-il-an′-thēs
Strob-il-or′-ach-is
Strob′-us
Stro-man′-the
Stro-mat-op′-ter-is
Stroph-an′-thus
Stroph-ol-i′-rĭ-on
Stru-ker′-ĭ-a
Stru-ma′-rĭ-a
stru-ma′-rĭ-um
stru-ma′-tum
strup-if-ol′-ĭ-a
Stru′-thĭ-ol-a
Stru-thĭ-op′-ter-is
Stru′-thĭ-um
Strych′-nos
Stu-art′-ĭ-a
Stu-art-ĭ-a′-na
Stu-art′-ĭ-i
Sturm′-ĭ-a
Stur-tev-ant′-ĭ-i
Sty-la′-go
Sty-lan′-dra*
Sty-lid′-ĭ-ĕ-æ
Sty-lid′-ĭ-um
Sty-lim′-nus
Sty′-lis
Sty-loc-or′-yn-e
Sty-log-lōs′-sum
Sty-lol′-ep-is
Sty-loph′-or-um
sty-lo′-sa
Sty-los-an′-thēs
Sty-lu′-rus
Sty-pan′-dra
Styph-el′-ĭ-a
styph-el-ĭ-ŏ-i′-dēs
Styph-nol-ob′-ĭ-um
Styr-a′-cĕ-æ
styr-ac-if′-lŭ-a
styr-ac-if-ol′-ĭ-a
Styr-an′-dra
Styr′-ax
Suæ′-da
sua′-vĕ
sua′-vĕ-ol-ens
sua-vis′-sim-um
sub-ac-au′-lis
sub-al-pi′-na
sub-aur-ic-ul-a′-tum
sub-bif-lo′-ra
sub-car-no′-sum
sub-cor-da′-ta
sub-cor-tic-a′-lis
sub-cort-ic′-ĭ-um
sub-dĭ-aph′-an-um
sub-e-den-ta′-ta
Su′-ber*
su-ber-cul-a′-ta
sub-e-rec′-ta

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

su-ber-if-ol′-ĭ-a
su-ber-o′-sa*
sub-e-ro′-sa*
sub-fal-ca′-tum
sub-glau′-ca
sub-hir-tel′-la
Sub-lī′-mĭ-a
sub-lu-na′-tum
sub-mer′-sum
sub-per-en′-nis
sub-pet-ĭ-ol-a′-tum
sub-pin-na-tif′-id-a
sub-quin-quef′-id-um
sub-rep-an′-dum
sub′-seq-ua
sub-ses′-sil-is
sub-sin-u-a′-tum
sub-ter-ra′-nĕ-um
sub-tig-na′-tum
sub-ti-lis′-sim-us
sub-tu-ber-cul-a′-ta
Su-bul-a′-rĭ-a
su-bul-a′-tum
sub-um-bel-la′-ta
sub-ves-ti′-tum
sub-vil-lo′-sa
sub-vol-u′-bil-e
suc-ce-da′-nĕ-a
suc-cir-ub′-ra
Suc-ci′-sa
suc-cot-rĭ′-na
Suc-co′-vĭ-a
suc-cul-en′-tum
Suc-cu′-ta
sud-bur-y-en′-sis
sue′-cic-a
suf-fo-ca′-tum
suf-frut-es′-cens
suf-frut-ic-o′-sa
suf-ful′-ta
Su-ka′-na
sul-ca′-tum
sul-cic-ol′-lis
Sul-liv-ant′-i
sul-phur′-ĕ-a
Sul-ta′-ni
su-ma-tra′-na
Sum′-bul
Sum-un′-tĭ-a
sun-da′-ic-a
sund-en′-sĕ
Su-ni′-pi-a
sup-erb′-ĭ-ens
sup-erb′-um
sup-er-cil-ĭ-a′-rĕ
sup-er′-flŭ-a
sup-er-pŏ-e′-tic-us
sup-ra-so-rif′-er-um
sur-cu-lo′-sa
su-rin-am-en′-sis
Su-ring-ar′-ĭ-i
sur-rej-a′-num
sur-ru-cuch-en′-sĕ
Su-sar′-ĭ-um
su-si-a -na

sus-pen′-sa
Suth-er-land′-i
Suth-er-land′-ĭ-a
Su-trī′-na
Sut-to′-nĭ-a
su-tu-ra′-lis
Su-wor-ow′-i
Swain′-son-a
Swam-mer-dam′-ĭ-a
Swan-ĭ-a′-na
Swan-nĭ-a′-num
Swartz′-ĭ-a
Swartz′-ĭ-a′-na
Swartz′-ĭ-i
Swert′-ĭ-a
swert-ĭ-æ-fol′-ĭ-a
Swert′-ĭ-i
Swiet-en′-ĭ-a
Sy-ag′-rus
Sych-in′-ĭ-um
Sy-com-o′-rus
Sy-kes′-ĭ-a*
syl-het-en′-sĕ
syl-va′-tic-a
Syl-ves′-trēs
syl-ves′-tris
syl-vic′-ol-a
Sy′-mĕ-a
Sy-mĕ-a′-na
Sym-phach′-ne
Sym-phor′-ĭ-a
Sym-phor-ic-ar′-pus
Sym-phў-an′-dra
Sym-phў-og-lōs′-sum
Sym-phў-os-te′-mŏn
Sym′-phyt-um
Sym-pĭ-ez′-a
Sym-ploc-ar′-pus
Sym′-ploc-os
Syn-ad-e′-nĭ-um
Syn-an′-dra
Syn-an-the′-rĕ-æ
Syn-aph-leb′-ĭ-um
Syn-ar′-rhen-a*
Syn-ech-an′-thus
Syn-gen-es′-ĭ-a
Syn-gon′-ĭ-um
Syn-gram′-me
Syn-net′-ĭ-a
Syn-not′-ĭ-a
Syn′-siph-ōn
syph-il-it′-ic-a
syr′-ĭ-ac-us
Sy-ring′-a*
sy-ring-æ-flo′-rum
sy-ring-æ-fol′-ĭ-a
sy-ring-el′-la
sy-ring-if-ol′-ĭ-a
Sy-ring-o′-dĕ-a
sy-ring-oth-yr′-sis
Syr′-phid-æ
Syr′-phus
Sys-treph′-ĭ-a
sys′-tyl-a
Sys′-tyl-æ

Syz-yg′-ĭ-um
Szo-vit-sĭ-a′-num
Szo-wit′-zĭ-a

Tab-a′-cum
Tab-eb-u′-ĭ-a
Tab-er-næ-mon-ta′-na
Tab-er-næ-mon-ta′-ni
tab-ul-a′-re
tab-ul-if-or′-mis
Tac′-ca
Tac-ca′-cĕ-æ
tac-cæ-fol′-ĭ-um
Tac-ca′-rum
Ta′-chi-a
Ta′-chi-ad-e′-nus
Ta-chi-ga′-li-a
Tach′-in-a
Tac-so′-ni-a
tæd-ig′-er-a
Tæn-ĭ-oc-ar′-pum
Tæn-ĭ-oph-yl′-lum
Tæn-ĭ-op′-sis
Tæn-i′-tis
Tæt′-si-a
Tag-e′-tēs
tag-e-tif-lo′-ra
ta-hi-ten′-sis
Tain′-ĭ-a
Tal-au′-ma
Tal-bot′-ĭ-a
Tal-i-e′-ra
Ta-lig-a′-lĕ-a
Tal-i′-num
Tal-i′-sĭ-a
Tal′-pa
tam-ar-in-dif-ol′-ĭ-a
Tam-ar-in′-dus
tam-ar-is-cif-ol′-ĭ-a
Tam-ar-is-cin′-ĕ-æ
Tam′-ar-ix
tam-nŏ-i′-dēs
Tam′-nus
Tam-o′-nĕ-a
Ta′-mus
tan-ac-e′-tif-ol′-ĭ-a
Tan-ac-e′-tum
Tan-ghin′-ĭ-a
Tank-er-vil′-lĕ-æ
Tank-er-vil′-lĭ-a
Ta-on-a′-bo
Tap-ei-on-i′-tēs
Taph-ri′-na
Ta′-pĭ-a
ta-pi-ŏ-i′-dēs
Ta-pog-o′-mĕ-a
tar-ax-ac-if-ol′-ĭ-a
Tar-ax′-ac-um
Tar-chon-an′-thus
tar-dif-lo′-rus
tar-di′-va
Tar-en′-na
Tar-gi-o′-ni

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

tar-tar′-ĕ-a
tar-tar′-ic-um
Tar-ton-raï′-ra
Tasch-en-berg′-ĭ
Tas-man′-nĭ-a
ta-tar′-ic-a
Tat-ton-ĭ-a′-num
Tat-u′-la
taur′-ic-a
taur-i′-na
Taus-che′-rĭ-a
Tav-er-nĕ-e′-ra
Tax-an′-them-a
Tax′-ĕ-æ
tax-if-ol′-ĭ-a
Tax-o′-dĭ-ĕ-æ
Tax-o′-dĭ-um
tax-ŏ-i′-dēs
Tax′-us
ta-yg-et′-ĕ-a
Tay′-lor-i
Taz-et′-ta
Tchih-atch-ew′-ĭ-i
Tec-o′-ma
Tec-oph-il-æ′-a
Tec′-ton-a
tec-to′-rum
tec′-tum
Teed′-ĭ-a
T-es-da′-lĭ-a
Te-gan′-ĭ-um
te-hu-ac-en′-sis
Tel-am-o′-nĭ-us
Tel-an-the′-ra
Tel-a′-rĭ-us
Tel-ei-an-the′-ra
Te-lek′-ĭ-a
Te-lem′-ach-i
Te-leph-ĭ-as′-trum
te-leph-ĭ-ŏ-i′-dēs
Te-leph′-ĭ-um
Tel-fair′-ĭ-a
Te-lip-o′-gōn
Tel′-lim-a
Tel-mat-ei′-a
te-lon-en′-sis
Te-lo′-pĕ-a
Temple-ton′-ĭ-a
te-mul-en′-tum
ten-a-cis′-sim-a
Ten-ag-ei′-a
Te′-nar-is
ten′-ax
Ten-da′-na
ten-eb-ric-o′-sus
ten-eb-ro-sa′-na
ten-el′-la
ten′-er-um
Ten-o-rĕ-a′-na
Ten-o′-rĭ-i
ten-ta-cul-a′-ta
ten-ta′-cul-um
Ten-thre-din′-id-æ
ten-thre-din-if′-er-a
Ten-thre′-do
ten′-ŭ-ĕ
ten-ŭ ic-an′-lis
ten-ŭ-if-lo′-rum
ten-ŭ-if-ol′-ĭ-um
ten-ŭ-il′-ob-us
ten′-ŭ-ĭ-or
ten′-ŭ-is
Tep-ej-il-o′-te
Teph-ri′-tis
teph-ros-an′-thos
Teph-ro′-sĭ-a
Ter-am′-nus
Ter-at-oph-yl′-lum
ter-eb-in-thif-ol′-ĭ-us
ter-eb-in-thin-a′-cĕ-um
Ter-eb-in′-thus
ter′-ēs
ter-et-ic-au′-lis
ter-et-if-ol′-ĭ-us
Ter′-mēs
Ter-min-a′-lĭ-a
Ter-min-a′-lis
ter-na′-ta
Ter-na′-tĕ-a
ter-na-ten′-sis
ter-na′-tĕ-um
Ter-naux-ĭ-a′-na
ter-nif-ol′-ĭ-a
Tern-stræm′-ĭ-a
Tern-stræm-ĭ-a′-cĕ-æ
Terp-nan′-thus
ter-res′-tris
Tes-sa′-rĕ-a
tes-sel-la′-tum
Tes-ta-cel′-la
tes-ta′-cĕ-um
tes-tic-ul-a′-tum
Tes-tu-din-a′-rĭ-a
Te′-ta
tet-rac-an′-tha
Tet-rac-ar′-pum
Tet-rac′-er-a
Tet′-rach-is
tet-rac′-op-is
Tet-rad-e′-nĭ-a
Tet-rad′-ĭ-um
Tet-rad-yn-am′-ĭ-a
Tet-rag-as′-tris
Tet-rag-o′-nĭ-a
Tet-rag-o-nĭ-a′-cĕ-æ
Tet-rag-o-nol′-ob-us
Tet-rag-o′-noth-e′-ca
tet-rag-o′-nus
tet-rag′-yn-um
Tet′-rah-it
Tet-rah-i′-tum
Tet′-ral-ix
Tet-ram′-el-ēs
Tet-ram-er′-ĭ-um
Tet-ram-i′-cra
tet-ran′-dra
Tet-ran-e′-ma
Tet-ran-eu′-ra
Tet-ran-the′-ra
Tet-ran′-thus
Tet-ran-ych′-id-æ
Tet-ran′-ych-us
Tet-rap-as′-ma
Tet-rap-el′-tis
tet-raph-yl′-lum
tet-rap′-la
tet-rap-las′-ĭ-um
Tet-rap-o′-gōn
tet-rap′-ter-a
Tet-rap′-ter-ys
tet-ră-quet′-ra
tet-ras-per′-ma
tet-ras′-pis
Tet-rath-e′-ca
Tet-raz-yg′-ĭ-a
teuc-rĭ-ŏ-i′-dēs
Teuc′-rĭ-um
Teus′-cher-i
Teu-ton′-ĭ-a
tex-a′-na
tex-en′-sis
Tex′-tor-i
Teys-man′-nĭ-a
Teys-man′-nĭ-a′-na
Thal-am′-ĭ-a
Thal-a′-sĭ-um
thal-as′-sic-a
Tha′-li-a
Tha-lĭ-a′-na
thal-ic-trif-ol′-ĭ-a
thal-ic-trŏ-i′-dēs
Thal-ic′-trum
Tham′-nĕ-a
Tham-noch-or′-tus
Tham-nop′-ter-is
Thap′-si
Thap′-sĭ-a
The′-a
the-ba′-ic-a
*Thec′-a**
The-cos-te′-le
the-if′-er-a
The′-la*
The-leb′-ol-us
Thel-em-an-nĭ-a′-na
The-leph′-or-a
The-les-per′-ma
The-lig′-on-um
Thel-lus-on′-ĭ-i
The-lyg-on′-ĕ-æ*
The-lyg′-on-um
The-lym-i′-tra
The-lyp-o′-gōn
The-lyp′-ter-is
the-lyp-ter-ŏ-i′-dēs
Them-is-toc-le′-sĭ-a
The-nar′-dĭ-a
The-ob-ro′-ma
the-ŏ-i′-dēs
Thĕ-oph-ras′-ta
The′-ra
The-re′-sĭ-a
ther-ma′-lis

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā′*-lmist; ĕ as in sl*ĕn′*-der; ē as in v*ē′*-ined; ĭ as in th*ĭn*; ī as in mach-*ī′*-nist; ŏ as in r*ŏt′*-ten; ō as in v*ō′*-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū′*-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in *pain*; au as *ou* in *house*; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ther′-mĭ-a
Ther-mop′-sis
The-rol-ep′-ta
The-ro-po′-gŏn
The′-si-um*
Thes-pes′-ĭ-a
The-ve′-tĭ-a
thi-an-schan′-ic-a
Thi-baud′-ĭ-a
Thi-baut-ĭ-a′-na
Thi-baut′-ĭ-i
Thie-baut′-ĭ-a
Thlad-ĭ-an′-tha
Thlas′-pi
Thom′-as-i
Thom-as′-ĭ-a
Thom-as′-ĭ-i
Thomp-so′-ni
Thomp-so-nĭ-a′-na
Thom′-so-næ
Thom′-so-ni
Thom-so′-nĭ-a
Thom-so-nĭ-a′-num
Thou-ars′-ĭ-i
Thou-i′-ni
Thou-i′-nĭ-a
Thri′-nax
Thrin′-cĭ-a
Thrips
Thrix-sper′-mum
Thrÿ-al′-lis
Thryp-tom′-en-e
Thu′-ja
Thu-jop′-sis
Thun-berg′-ĭ-a
Thun-berg-ĭ-a′-num
Thun-berg′-ĭ-i
Thun′-ĭ-a
Thu-re′-ti
thu-rif′-er-a
thu-rif-ra′-ga*
Thuy′-a
thuy-ŏ-i′-dēs
Thuy-op′-sis
Thwaites′-ĭ-i
Thy-a′-na
Thy-lac-an′-tha
Thy-lac-op′-ter-is
Thym′-bra
Thym-el-æ′-a
Thym-el-æ-a′-cĕ-æ
thym-if-ol′-ĭ-a
thym-ŏ-i′-dēs
Thym′-us*
Thyr-sac-an′-thus
Thyr-san′-thus
thyr-sif-lo′-rum
thyr-sŏ-i′-dĕ-a
Thyr-sop′-ter-is
Thyr′-sul-a
thys-an-o′-dēs
thys-an-o-tŏ-i′-dēs
Thys-an-o′-tus
thys-san-ol′-ep-is
Tĭ-a-rel′-la

Tĭ-a-rid′-ĭ-um
ti-bi′-cin-is
Tib-ouch-i′-na
Ti-bour′-bou
Tic-o′-rĕ-a
Ti-ga′-rĕ-a
Tig′-lĭ-um
Tig-rid′-ĭ-a
tig-ril-la′-rĭ-a
tig-ri′-num
Til-e′-sĭ-a
Til′-ĭ-a
Til-ĭ-a′-cĕ-æ
til-ĭ-a′-cĕ-um
Til-i-a′-cor-a
Til′-ĭ-æ
til-ĭ-æ-flo′-ra
Til-læ′-a
Til-land′-sĭ-a
til-land-sĭ-ŏ-i′-dēs
Til-le′-tĭ-a
Tim′-mĭ-a
Ti-nan′-tĭ-a
tinc-to′-rĭ-a
tinc′-tum
Tin′-ĕ-a
Tin-ĕ-i′-na
ting′-ens
ting-it-a′-num
ti-nif-ol′-ĭ-a
Tin′-ne-a
Ti′-nus
Tip′-ul-a
Tip-ul-a′-rĭ-a
Tip′-ul-id-æ
tip-ul-if-or′-mis
Tis-che′-rĭ-a
Ti-ta′-num
Ti-tho′-nĭ-a
tith-ym-al-ŏ-i′-dēs
Tith-ym′-al-us
Tit-rag′-yn-e
Titt-man′-nĭ-a
Tob-i′-ra
tob-ol-skĭ-a′-num
Toc-o′-ca
Toc-oy-e′-na
Tod-ar-o′-a
Tod-da′-lĭ-a
To′-dĕ-a
To-field′-ĭ-a
Tol-lĭ-a′-na
Tol-mie′-a
Tol′-pis
Tol-u-it′-er-a
to-men-tel′-la
to-men-to′-sa
To′-mex
Tom-ic′-id-æ
Tom′-ic-us
tom-ĭ-ol′-oph-a
Tom-mas-i′-ni-a′-na
To-ne-lĭ-a′-na
To-ne′-lĭ-i
ton-kin-en′-sis

Ton-ning′-ĭ-a
Ton-sel′-la
Ton-ta′-nĕ-a
Ton-tel′-ĕ-a
Too′-na
To′-ra
Tor-dyl′-ĭ-um
Tor-e′-nĭ-a
Tor-ing′-o
Tor-men-til′-la
tor-min-a′-lis
Tor-ne′-lĭ-a
To′-ro
Tor-re′-sĭ-a
Tor-rey′-a
Tor-rey′-i
Tor-ru′-bĭ-a
tor′-ta
tor′-til-is
Tor-tric′-id-æ
Tor-tric-i′-na
Tor′-trix
Tor′-tul-a
tor-tul-a′-ta
tor-tŭ-o′-sa
Tor′-ul-a
tor-ul-o′-sa
Tot-a′-ra
Tot′-ta
Tou′-mat-ou
Tour-nef-or′-tĭ-a
Tour-nef-or′-tĭ-
Tour-re′-tĭ-a
to-va-ren′-sis
To-va′-rĭ-a
To-vom-i′-ta
Towns′-hend-i
tox-ic-a′-rĭ-a
Tox-ic-od-en′-dron
Tox-ic-oph-læ′-a
tox′-ic-um
tox-if′-er-a
Tox-os-tig′-ma
To′-za
Tra-che′-a
Trach-e-lĭ-ŏ-i′-dēs
Trach-e′-lĭ-um
Trach-e-los-per′-mum
Tra-chyc-ar′-pus*
Tra-chym′-en-e
Tra-chyn-o′-tĭ-a
Tra-chys-te′-mŏn
Tra-chyt-el′-la
Trad-es-can′-ti
Trad-es-can′-tĭ-a
Trag-ac-an′-tha
trag-ac-an′-thæ
Trag′-ĭ-a*
Trag′-ĭ-um
Trag-op-o′-gi-pra-ten′-sis
Trag-op-o′-gŏn
Trag′-us
Tra′-ma
Tra′-met-ēs
trans-pa′-rens

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in *ăp*-art′; ā as in ps*ā*′-lmist; ĕ as in sl*ĕn*′-der; ē as in v*ē*′-ined; ĭ as in th*ĭn*; ī as in mach-*ī*′-nist; ŏ as in *rŏt*′-ten; ō as in *vō*′-ter; ŭ as in pow′-er-f*ŭl*; ū as in r*ū*′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ain*; au as *ou* in h*ou*se; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Tra′-pa
trap-e-sif-or′-me
trap-e-zif-or′-mis
trap-e-zĭ-ŏ-i′-dēs
Trat-ten-ĭk′-ĭ-a
Traut-vet-ter′-ĭ-a
trav-an-co-ren′-sis
Trav-ers′-ĭ-i
Tre-cu-lĕ-a′-na
Tre-cu′-lĭ-a
Treis′-ĭ-a
Tre-man′-dra
Tre-man′-drĕ-æ
Tre-man′-thus
Trem′-ex
trem′-ul-a
Trem′-ul-æ
trem-ul-if-or′-mis
trem-ul-ŏ-i′-dēs
Tren-tep-oh′-lĭ-a
Trev-e′-sĭ-a
Trev-ir-a′-na
Tre-vo′-a
Trew′-ĭ-a
trĭ-ac-an′-thus
Trĭ-ach′-yr-um
trĭ-ad-e′-nĭ-um
Trĭ-ad′-ic-a
Tri-a′-næ
trĭ-an′-dra
Tri-a′-nĕ-a
trĭ-ang-ul-a′-ris
trĭ-ang-ul-a′-ta
trĭ-ang′-ul-um
Trĭ-an′-them-a
trĭ-ar-is-tel′-la
Trĭ′-as
Trib-lem′-ma
Trib-rach′-ĭ-um
Trib′-ul-us
Tric-an′-tha
tric-aud-a′-ta
Tric-er-ai′-a
Trich-æ′-ta
Trich-æ′-te
Trich-an′-tha*
Trich′-ar-is
Trich-il′-ĭ-a
Trich-in′-ĭ-um
Trich-ĭ-os-o′-ma
Trich-ob′-as-is
trich-oc-al-yc-i′-na
Trich-oc-ar′-pa
Trich-oc-au′-lon
Trich-oc-en′-trum
Trich-oc-eph′-al-us
Trich-oc′-er-os
trich-oc′-lad-a
trich-o′-dēs
Trich-od-es′-ma
Trich-o′-dĭ-um
Trich-og-as′-trēs
Trich-og-lōt′-tis
trich-ŏ-i′-dĕ-um
Trich-ol-æ′-na
trich-om′-an-e-fol′-ĭ-um
Trich-om′-an-ēs
trich-om-an-ŏ-i′-dēs
Trich-on-e′-ma
Trich-op-et′-al-um
Trich-oph′-or-um
trich-oph-yl′-lum
Trich-op-i′-lĭ-a
Trich-op′-ter-is
Trich-os-ac′-me
trich-os-an′-tha
Trich-os-an′-thēs
Trich-os′-ma
Trich-os-o′-rus
trich-os-per′-ma
Trich-os′-por-um
Trich-os-te′-ma
trich-ot′-om-um
Tric-lis′-sa
tric-oc′-cum
tric′-ol-or
tric-ol-or′-um
Tric-on′-dyl-us
tric-or′-ne
Tric-or′-yn-e
Tric′-rat-us
Tric-us-pid-a′-rĭ-a
tric-us-pid-a′-ta
Tric-us′-pis
Tric-yr′-tis
trid-ac′-tyl-a
trid-ac-tyl-i′-tēs
Tri′-dax
Trid′-ens
trid-en-ta′-tum
Trid-en′-tĕ-a
Trid′-ĭ-a
Trid′-ym-us
Trĭ-en-ta′-lis
trif-as-cĭ-a′-ta
trif′-id-a
trif-lo′-rum
trif-ol′-ĭ-a
trif-ol-ĭ-a′-ta
Trif-ol′-ĭ-i
Trif-ol′-ĭ-um
trif-ur-ca′-tum
Trif-ur′-cĭ-a
Trig-lo′-chin
Trig-lōs′-sum
Trig-o′-nel-la
Trig-o′-nĭ-a
Trig-o-nid′-ĭ-um
trig-o-noc-au′-lis
Trig-o-noth-e′-ca
Tri-gue′-ra
trig′-yn-um
tril-i-nĕ-a′-ta
tril-in′-guĕ
Tril-i′-sa
Tril-i′-sĭ-a
Tril′-ix
Tril-lĭ-a′-cĕ-æ
Tril′-lĭ-um
tril′-ob-a
tril-ob-a′-tum
tril′-ob-um
Tri-men-ĭ-a′-nus
Trim-er-is′-ma
trim-es′-tris
Trim-ez′-ĭ-a
trin-er′-vĭ-a
trin-er′-vis
Trĭ′-nĕ-a
trin-ot-a′-tus
Trĭ-od′-ĭ-a
trĭ-oic′-us
Trĭ-o′-len-a
trĭ-on-if-lo′-ra
Trĭ′-on-um
Trĭ-op′-ter-ys
trĭ-or-ni-thoph′-or-a
Trĭ-os′-tĕ-um
trip-ar-ti′-ta
trip-et′-al-a
Trip-et-al-ei′-a
trip-et-al-ŏ-i′-dēs
Trip-et-e′-lus
Triph-æ′-na
Triph-as′-ĭ-a
Triph′-or-a
Triph-rag′-mĭ-um
triph-yl′-la
Triph-y-sa′-rĭ-a
Trip-lad-e′-nĭ-a
Trip-la′-ris
Trip-leu′-ra
trip-lin-er′-va
trip-od-a′-lis
Trip-ol′-ĭ-um
Trip′-sac-um
trip′-ter-is
trip′-ter-on
Trip-ter-os-per′-mum
Trip-ter-yg′-ĭ-um
Trip-til′-ĭ-on
trip-ud′-ĭ-ans
trip-unc-ta′-na
trip-unc-ta′-ta
tri-quet′-rum
Tris-e′-tum
Tris′-ĭ-ol-a
Tris-mer′-ĭ-a
Tris-tag′-ma
Tris-tan′-ĭ-a
tris′-tĕ
Trit-el-ei′-a
trit-er-na′-ta
Trith-ri′-nax
Tri′-tic-i
Tri′-tic-um
Trit′-om-a*
Trit-om-an′-the
Trit-om′-ĭ-um
Tri-to′-nĭ-a
Tri-um-fet′-ta
trĭ-um′-phans
Trĭ-u-rid′-ĕ-æ
Trĭ-u′-ris
triv-ĭ-a′-lis

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Trix-a-go
Trix′-is
Triz-eux′-is
Tro-che′-tĭ-a
Troch′-il-us
Troch-is-can′-thēs
Troch-oc-ar′-pa
Troch-os-tig′-ma
tro-glod′-it-ēs
Trol′-lĭ-us
Tro-mot′-rich-e
Trop-æ′-ol-ĕ-æ
Trop-æ′-ol-um*
Troph-ĭ-an′-thus
Troph′-is
trop′-ic-us
Trop-id′-ĭ-a*
Tros
tros′-sul-a
Trōx′-im-on
trul-lif′-er-um
Trun-ca′-rĭ a
trun′-ca-ta
trun-ca-tel′-lum
trun-ca′-tul-um
Try-mal′-ĭ-um
Tryph-æ′-na
Tsi-a′-na
tso-mo-en′-sis
Tsu′-ga
tub-a′-ta*
Tu-bĕ-a′-na
Tu′-ber*
Tu-ber-a′-cĕ-i
Tu-ber-ci′-nĭ-a
Tu-ber-cul-a′-rĭ-a
tu-ber-cul-a′-ta
tu-ber-cul-o′-sus
tu-ber-o′-sa
tub-ic′-in-a
tub-if′-er-a
tub-if-lo′-rus
tub-is′-path-a
tub-ul-o′-sa
Tuck′-er-i
Tuck-er-man′-nĭ-a
tu-cu′-man-en′-sis
Tul-ba′-ghĭ-a
Tu′-lip-a
Tu′-lip-æ
tu-lip-if′-er-a
tu-lip-if-ol′-ĭ-a
tu-lip-if-or′-mis
Tum′-bo-a
tum′-id-a
Tu′-na
tun-bridg-en′-sĕ
Tun′-ga
Tun′-ic-a
Tu′-pa
Tup-id-an′-thus
Tu-pis′-tra
tu-pis-trĕ-i′-des
tur-bin-a′-ta
tur-bin-el′-lus
turc′-ic-a
tur′-gid-a
Tur-go′-sĕ-a
Tu-ri-al′-væ
tu′-rĭ-o
tu-rĭ-o-na′-na
turk-es-ta′-nic-a
Turn-bul′-lĭ-i
Tur′-ner-a
Tur-ner-a′-cĕ-æ
Tur′-ner-i
Tur-pin′-ĭ-a
Tur-pin′-ĭ-i
Tur-ræ′-a
Tur-ri′-tis
Tus-sa′-ca
Tus-sa′-cĭ-a
Tus-sil-a′-gin-is
Tus-sil-a′-go
Tweed′-ĭ-a
Tweed-ĭ-a′-na
Tweed′-ie-i
Ty′-che-a
Ty′-chĭ-us
Ty-dæ′-a
Ty-er-man′-ni
Tyl-en′-chus
Tyl-och-i′-lus*
Tyl-og-lōs′-sa
Tyl-oph′-or-a
Tym-pan-an′-the
Ty′-pha
Ty-pha′-cĕ-æ
ty′-phin-a
Typh-loc-y′-ba
Ty-pho′-nĭ-um
Ty′-phul-a
typ′-ic-a
typ-og′-raph-us
tyr-ĭ-an′-thin-a
tyr-o-len′-sis
Ty-ton′-ĭ-a

U-cri-a′-na
Ud-o′-ra
U-ge′-nu
Ug′-ni
U′-lex
u-lio′-in-a
u-li-gin-o′-sum
Ul-lo′-a
Ul-lu′-cus
ul-ma′-rĭ-us
Ul′-mĕ-æ
Ul′-mi
ul-mif-ol′-ĭ-a
Ul′-mus
U-los′-tom-a
Ul-ux′-ĭ-a
um-bel-la′-tum
Um-bel-lif′-er-æ
Um-bel-lul-a′-rĭ-a
um-bil-i′-cĕ-i′-dēs
Um-bil-i′-cus*
um-bo-na′-tum
um-bra-cul-if′-er-a
Um-brel′-la
um-bro′-sa
U-na-nu′-ĕ-a
Un-ca′-rĭ-a
un′-cĭ-a
Un-cif′-er-a
un-ci-na′-ta
un-ci-nif-ol′-ĭ-a
Un-ci′-nul-a
un-da′-ta
un-dec-im-punc-ta′-ta
un-dul-æ-fol′-ĭ-a
un-dul-a-tif-ol′-ĭ-a
un-dul-a′-tum
U′-ned-o*
Ung′-er-i
Ung-na′-dĭ-a
Un-gua′-cha
un-guic-ul-a′-ris
un-guic-ul-a′-ta
un-guip-et′-al-a
un-gul-if-ol′-ĭ-a
u-nic′-ol-or
u-nic-or′-nĕ
u-nid-en-ta′-tum
u-nif-lo′-ra
u-nil-at-er-a′-le
U′-nĭ-ol-a
U-nis-e′-ma
u-ni′-tum
u-niv-it-ta′-ta
U-no′-na
U-ral′-ep-is
U-ral-ep′-sis
u′-ral-um
U-ran-an′-thus
U-ran′-ĭ-a
Ur-a′-rĭ-a
Ur-cĕ-ol-a′-rĭ-a
ur-cĕ-ol-a′-tus
Ur-cĕ-ol-ĭ′-na
ur-cĕ-ol-o′-rum
U-rech-i′-tēs
U-re-din′-ĕ-æ
U-re′-do
Ur-e′-na
u′-rens
u-ren-tis′-sim-a
Urg-in′-ĕ-a
U-roc-ys′-tis*
U-rom′-yc-ēs
U-rop-ed′-ĭ-um
U-rop-et′-al-um
u-roph-yl′-la
U-rŏ-Skin′-ner-a
U-rŏ-Skin′-ner-i
U-ros′-path-a
U-ros-per′-mum
u-ros-tach′-y-a
Ur-si′-nĭ-a
ur-si′-num
Ur-ti′-ca*

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; y as ĭ; ȳ as ī; æ, œ, ei, as *ai* in p*ai*n; au as *ou* in h*ou*se; g, c, and ch, always hard, as, for example, g in *g*ood, c in m*u*scular, and ch in *Ch*ristian. (For the old method, see page 276.)

* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Ur-ti-ca′-cĕ-æ
Ur-ti′-cæ
ur-ti-cæ-fol′-ĭ-a
ur-ti-ca′-rĭ-a
Ur-ti′-cĕ-æ
ur-ti-cif-ol′-ĭ-a
Ur-vil′-lĕ-a
u-sit-a-tis′-sim-um
us-ne-ŏ-i′-dēs
Us-pal-la-ten′-sis
us-su-ri-en′-sis
Us-te′-rĭ-a
Us-til-a-gin′-ĕ-i
Us-til-a′-go
us-tul-a′-ta
u-tah-en′-sis
U-ta′-nĭ-a
u′-til-e
u-til-is′-sim-a
U-tric-ul-a′-rĭ-a
U-tric-ul-a′-rĭ-ĕ-æ
u-tric-ul-a-rĭ-ŏ-i′-dēs
u-tric-ul-a′-ta
u-tric-ul-o′-sa
U′-va
U-va′-rĭ-a
U′-va-ur′-si
Uve-da′-lĭ-a
u-vif′-er-a
U-vul-a′-rĭ-a

Vac-ca′-rĭ-a
Vac-ci-nĭ-a′-cĕ-æ
Vac-ci-nĭ-el′-la
vac-ci-nif-ol′-ĭ-um
vac-ci-nĭ-if-ol′-ĭ-um
Vac-ci′-nĭ-um*
Va-chel′-lĭ-i
vac-il′-lans
vag′-ans*
va-gi-na′-lis
va-gi-na′-tum
Va-gi-nul-a′-rĭ-a
Vail-lan′-tĭ-a
Val-an′-tĭ-a
val-den′-sis
Val-de′-sĭ-a
Val-di′-vĕ-a
val-di-vĕ-a′-na
val-di-vĕ-en′-sis
val-en-ti′-na
Val-en-ti′-ni
Val-er-an′-di
Val-er-ĭ-a′-na
Val-er-ĭ-a′-nĕ-æ
Val-er-ĭ-a-nel′-la
val′-id-um
Val-la′-ris
Val-le′-sĭ-a
val-le′-sĭ-ac-a
Val-lis-ne′-rĕ-a
val-lis-ne-rĕ-æ-fol′-ĭ-a
Val-lo′-ta

Van-a′-rĭ-a
Van′-da
van-da′-rum
Van′-dĕ-æ
Van-del′-lĭ-a
Van-der-dunck′-ĭ-i
Van-der-mees′-chĭ-i
Van-de′-sĭ-a
Van-es′-sa
Van-gue′-rĕ-a
Van-gui-e′-ra
Van-hout′-tĕ-a
Van-hout-tĕ-a′-num
Van-hout′-tĕ-ĭ
Van-il′-la
Van-ta′-nĕ-a
Van-Volx-em′-ĭ-i
vap-o-ra′-rĭ-us
Var-ga′-sĭ-a
var-ĭ-a′-bil-is
var′-ĭ-ans
var-ĭ-a′-ta
va-ric-o′-sum
var-ĭ-eg-a′-na
var-ĭ-eg-a′-ta
var-ĭ-if-or′-mis
var-ĭ-ol-a′-ris
var-ĭ-ol-a′-tum
var-ĭ-ol-o′-sa
var′-ĭ-um
Va-ro′-nĭ-a
Vas-co′-a
Vas-con-cel′-lĕ-a
vas′-ic-a
vas-ta′-trix
Vau-an′-thēs
Va-va′-ga
Va-vang′-a
veg′-et-a
Veitch′-ĭ-a
Veitch-ĭ-a′-num
Veitch′-ĭ-i
Ve-la′-ga
ve-la′-ta
Vel-as-que′-zĭ-a
Vel-e′-zĭ-a
Vel′-la
Vel-lei′-a
vel′-lĕ-um
Vel-lo′-zĭ-a
Vel-lo-zĭ-a′-num
Vel-lo′-zĭ-ĕ-æ
Vel-theim′-ĭ-a
vel-u-ti′-na
Ven-a′-na
ven-e-na′-ta
ven-e-nif′-er-a
ven-e-no′-sum
ve′-nĭ-a
Ve-nid′-ĭ-um
ve-no′-sa
Ven-ten-a′-tĭ-a
ven′-ti
ven-til-a′-brum
Ven-til-a′-go

ven-tric-o′-sum
ve-nul-o′-sum
ven-us′-ta
Vep′-ris
ve′-ra
Ve-rat-ax′-us
ve-ra-trif-ol′-ĭ-a
Ve-ra′-trum
ver-ba-nen′-sis
Ver-bas′-cĕ-æ
ver-bas-cif-ol′-ĭ-a
Ver-bas′-cum
Ver-be′-na
Ver-be-na′-ca
Ver-be-na′-cĕ-æ
Ver-bes-i′-na
ver-e-cun′-dum
Ve-rei′-a
ve′-ris
Ver-lo′-ti
ver-mic-ul-a′-ris
ver-mic-ul-a′-ta
Ver-mif′-ug-a
ver′-na
ver-na′-lis
ver-nic-if′-er-a
ver-nic-o′-sa
ver′-nix
ver-nix′-ĭ-um
Ver-non′-ĭ-a
Ver-on-i′-ca*
ver-ru-cif′-er-a
ver-ru-co′-sa
Ver-schaf-fel′-tĭ-a
Ver-schaf-fel-tĭ-a′-na
Ver-schaf-fel′-tĭ-i
ver-sic′-ol-or
ver-tic-il-la′-ris
ver-tic-il-la′-tus
Ver-tic-il′-lĭ-um
Ver-tic-or′-dĭ-a
Ver-ul-a′-mĭ-a
ve′-rum
Ver-væ-nĕ-a′-na
ves′-ca
Ve-si-ca′-rĭ-a*
ve-si-ca′-rĭ-us
ve-si-ca′-tor
ve-si-ca-to′-rĭ-a
ve-si-ca′-trix
ve-si-cul-o′-sum
Ves-ling′-ĭ-a
Ves′-pa
ves-per-ti′-lĭ-o
Ves-per-ti-lĭ-o′-nis
ves-per-ti′-na
ves-pif′-er-a
ves-pif-or′-mis
Ves-pŭc′-ci-a
ves-ta′-lis
Vest′-ĭ-a
ves-ti′-ta
vex′-ans
vex-a-ti′-vum
vex-il-la′-rĭ-um

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* This word is discussed at the end of the Pronouncing Dictionary.

Pronouncing Dictionary—*continued.*

Vi-borg′-ĭ-a
vi-bur-nif-lo′-ra
vi-bur-nŏ-ĭ′-dēs
Vi-bur′-num
Vic′-ĭ-a
Vic′-ĭ-æ
Vic′-tor
Vic-to′-rĭ-a
Vic-to′-rĭ-æ-Re-gi′-næ
Vic-to-rĭ-a′-lis
Vic-tor-ip-er-re′-a
Vid-a′-lĭ-i
Vieil-lard′-ĭ-i
Viel-lard′-ĭ-i
Vieus-seux′-ĭ-a
Vig-i-e′-ra
Vig-i-e′-ri
Vign′-a
Vig-nald′-ĭ-a
Vig-ui-e′-ra
Vil′-fa
Vil-lan-ov′-a
Vil-la-re′-sĭ-a
Vil-lar′-ĭ-a
Vil-lar′-sĭ-a
Vil-lar-sĭ-a′-na
Vil-lar′-sĭ-i
vil′-lic-a
vil-lif′-er-a
vil-lo′-sa
Vil-lo′-sæ
vil-lo′-sul-us
Vil-mor-i′-nĭ-a
Vil-mor-i-nĭ-a′-na
vi-min-a′-lis
Vi-min-a′-rĭ-a
vi-min′-ĕ-um
Vin′-ca
vin-cæ-flo-ra
vin-cent-i′-nus
Vin-cet-ox′-ic-um
vi-nĕ-a′-le
vi-nif′-er-a
vi-no′-sa
Vĭ′-ol-a
vĭ-ol-a′-cĕ-a
Vĭ′-ol-æ
vĭ-ol-æ-fol′-ĭ-um
vĭ-ol-æ-ŏ-ĭ′-dēs
Vĭ-ol-a′-rĭ-ĕ-æ
vĭ-ol-es′-cens
Vi-or′-na
Vi-pa′-ni
Vi-ray′-a
vir′-ens
vir-es′-cens
Vi-rey′-a
vir-ga′-ta
Vir-gau′-rĕ-a
Vir-gil′-ĭ-a
vir-gin-a′-le
vir-gin′-ĕ-us
vir-gin-ĭ-a′-na
vir-gin′-ic-a
vir-gin-ĭ-en′-sis
Vir-gul-a′-rĭ-a
vir-gul-a′-tum
vir-id-a′-n ı
vir-id-ic-ol′-lis
vir-id-if-lo′-ra
vir-id-if-ol′-ĭ-a
vir′-id-is
vir-id-is′-sim-a
vir-id′-ul-a
Vi′-rol-a
Vis-ca′-rĭ-a
vis′-cid-a
vis-cid′-ul-a
vis-co′-sa
vis-co-sis′-sim-a
Vis′-cum
Vis-i-a′-nĭ-a
Vism′-ĭ-a
Vis-na′-ga
Visn′-ĕ-a
Vi-tal′-ba
Vi-tal-ĭ-a′-na
Vit-el-la′-rĭ-a
vit-el-li′-næ
vit-el-li′-num
Vi′-tex
Vi-tic-as′-trum
Vi-tic-el′-la
vi-tic′-ol-a
vi-tic-ul-o′-sa
vi-ti-en′-sis
vi-tif-ol′-ĭ-us
Vi′-tis
vi-tis-a′-na
Vi-tis-I-dæ-a
vit-tæ-for′-me
Vit-ta′-rĭ-a
vit-ta′-ta
vit-tig′-er-a
Vitt-man′-nĭ-a
Viv-i-a′-nĭ-a
Viv-i-a′-nĭ-ĕ-æ
vi′-vic-ans
vi-vip′-ar-i
vi-vip′-ar-um
Vo-and-zei′-a
Voch-i′-sĭ-a
Voch′-y-a
Voch-y′-sĭ-a
Voch-y-sĭ-a′-cĕ-æ
Vo-gel-ĭ-a′-na
Vo-gel′-ĭ-i
Vo-gel′-li
Vo-hi′-rĭ-a
volg-en′-sis
Vol-ka-mer′-ĭ-a
Volk-man′-nĭ-a
Vol-tai-re-a′-num
vol-u′-bil-is
Vol-uc-el′-la
vol-up′-tum
Vou-a′-pa
Vou′-ay
Voy′-rĭ-a
Vree-land′-i
Vries′-ĭ-a
Vrom′-ĭ-i
vul-ca′-nic-a
vul-ga′-ris
vul-ga′-tum
Vul-ner-a′-rĭ-a
vul-pa′-rĭ-a
Vul′-pi-a
vul-pi′-nus
Vuyl-stek-ĭ-a′-na
Wach-en-dorf′-ĭ-a
Wăg′-en-er-i
Wăg′-en-er-ĭ-a′-na
*Wăg′-ner-i**
Wăg-ner-ĭ-a′-num
Wahl-bom′-ĭ-a
Wahl-en-berg′-ĭ-a
Wailes′-ĭ-a
Wailes-ĭ-a′-num
Wait′-zĭ-a
Wake-ley-a′-num
Walck-en-œr′-a
Wald-schmid′-ĭ-a
Wald-stein′-ĭ-a
Wald-stein-ĭ-a′-na
Walk′-er-æ
Walk′-er-i
Walk-er-ĭ-a′-na
Wal-la′-cĕ-i
Wal-lich′-ĭ-a
Wal-lich-ĭ-a′-na
Wal-lich′-ĭ-i
Wal-lis′-ĭ-a
Wal-lis′-ĭ-i
Wall-roth′-ĭ-a
Wal-su′-ra
Wal′-ter-i
Wal-the′-rĭ-a
Wal-u-iew′-i
Wal-u-jew′-i
Wam′-pi
Wan′-ner-i
War-cew-ic′-zĭ-i
War-czew-ic′-zĭ-i
Ward-ĭ-a′-num
Ward′-ĭ-i
Wa-rĕ-a′-na
War-el-lĭ-a′-na
War-ming-ĭ-a′-num
War-ming′-ĭ-i
War′-ner-i
War-ner-ĭ-a′-num
War-ner′-ĭ-i
War-o-que-a′-num
War′-rĕ-a
War-rĕ-a′-na
War-ren′-ĭ-i
War-scew-ic-zel′-la
War-szew-ic-zĭ-a′-na
War-scew-ic′-zĭ-i
War-szew-ic-zel′-la
Wash-ing-to′-nĭ-a

Words derived from Latin and Greek (*i.e.*, all except those in italics) to be pronounced as follows: ă as in ăp-art′; ā as in psā′-lmist; ĕ as in slĕn′-der; ē as in vē′-ined; ĭ as in thĭn; ī as in mach-ī′-nist; ŏ as in rŏt′-ten; ō as in vō′-ter; ŭ as in pow′-er-fŭl; ū as in rū′-ler; ў as ĭ; ȳ as ī; æ, œ, ei, as *ai* in pain; au as *ou* in house; g, c, and ch, always hard, as, for example, g in *g*ood, c in muscular, and ch in *Ch*ristian. (For the old method, see page 276.)

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Pronouncing Dictionary—*continued.*

Wash-ing-to′-nĭ-a′-num
Wa′-ter-er-i
Wa-ter-ĭ-a′-na
Wat-so′-nĭ-a
Wat′-tĭ-i
Wa-va′-rĭ-a
Waw-ra′-nĕ-a
Weath-er-il′-li
Web-ber-ĭ-a′-na
Web′-bĭ-a
Web-bĭ-a′-na
Web′-bĭ-i
We′-ber-a
We-ber-ĭ-a′-na
Wed-del-ĭ-a′-na
Wed-e′-lĭ-a
Weig-e′-la
Weig-e′-lĭ-a
Weig-e′-lĭ-a′-na
Wein-man′-nĭ-a
Wein-man-nĭ-a′-num
Weir′-ĭ-i
Weis-man′-ni
Wel′-den-i
Welf′-ĭ-a
Wel-ling-to′-nĭ-a
Wel′-ton-i
Wel-ton-ĭ-en′-sis
Wel-wit′-schĭ-a
Wel-wit′-schĭ-i
Wend-land′-ĭ-a
Wend-land-ĭ-a′-na
Wend-land′-ĭ-i
Wen′-sĕ-a
Went-worth′-i
Went-worth-ĭ-a′-num
Wer-ne′-rĭ-a
West-pha-ling′-ĭ-a
West-ring′-ĭ-a
Whip′-plĕ-i
White-head′-ĭ-a
Whi′-tĕ-i
Whit-field′-ĭ-a
Whit-la′-vĭ-a
Whit′-ley-a
Whit′-ley-i
Whit′-ney-i
Whit′-tak-er-i
Whit-ting-ton-en′-sis
Why′-tĕ-i
Wi-borg′-ĭ-a
Wid-dring-to′-nĭ-a
Wiers-beck′-ĭ-i
Wig-and′-ĭ-a
wiŋ-and-ĭ-ŏ-i′-dēs
Wight-ĭ-a′-na
Wight′-ĭ-i
Wik-ström′-ĭ-a
Wilck-ĕ-a′-num
Wil-den-ow′-ĭ-i
Wil-der′-ĭ-i
Wild-ĭ-a′-na
Wiles-ĭ-a′-num
Wil-ford′-ĭ-i
Wilkes-ĭ-a′-na
Will-den-o′-vĭ-a
Will den-o′-vĭ-i
Will-den-ow′-ĭ-a
Wil-lem-e′-tĭ-a
Will′-iams-i
Will-iams-ĭ-a′-num
Will-iams′-ĭ-i
Will-iams-on′-i
Will-iams-on′-ĭ-i
Will-inck′-ĭ-i
Will-kom′-mĭ-i
Will-sĕ-a′-na
Wil-lug-bæ′-ya
Wil-lugh-bei′-a
Wil-mo-rĕ-a′-na
Wil-son′-i
Wil-son′-ĭ-i
Wind′-sor-i
Winn-ĭ-a′-na
Win′-ter-a
Win-ter-a′-na
Win′-ter-i
Wi-o′-ti
Wis-liz-e′-ni
Wis-ta′-rĭ-a
With-er-ing′-ĭ-a
Wit-se′-nĭ-a
Wit-te-a′-num
Wit-tels-b ıch′-ĭ-a
Witt-man-nĭ-a′-na
Wolf′-fĭ-a
wol-ga′-ric-a
Wol′-las-ton-i
Wol-las-ton′-ĭ-a
Wol-sten-holm′-æ
Wood-ford′-ĭ-a
Wood-ford′-ĭ-i
Wood′-sĭ-a
Wood′-sĭ-i
Wood-ward′-ĭ-a
Wool-gar-ĭ-a′-na
Wool′-las-ton-i
Worm′-ĭ-a
Worm-ski-old′-ĭ-a
Worm-ski-old′-ĭ-i
Wrang-el-ĭ-a′-na
Wray′-æ
Wray′-i
Wright′-ĭ-a
Wright-ĭ-a′-na
Wright′-ĭ-i
Wrig-ley-a′-na
Wulf′-en-i
Wulf-en′-ĭ-a
Wulf-en-ĭ-a′-na
Wulf′-fĭ-a
Wull-schlæg-el′-ĭ-a
Wurm′-bĕ-a
Würth′-ĭ-a
Wy-at′-tĭ-a′-na
Wy-eth′-ĭ-a

Xal-ap-en′-sis
xanth-ac-an′-tha
xanth′-in-um
Xanth-is′-ma
Xanth′-ĭ-um
xanth-oc′-al-yx
xanth-oc-ar′-pum
Xanth-oc-eph′-a-lum
Xanth-oc′-er-as
Xanth-och-y′-mus
Xanth-oc′-om-a
Xanth-oc-rom′-ŷ-on
xanth-od-ac′-tyl-a
xanth′-od-on
xanth-og-lŏs′-sum
xanth-ol-eu′-ca
xanth-oph-leb′-ĭ-um
xanth-oph-thal′-ma
xanth-oph-yl′-lus
Xanth-orh-i′-za
Xanth-or-rhœ′-a
Xanth-o′-sĭ-a
Xanth-os-o′-ma
Xanth-ox′-yl-on
Xanth-ox′-yl-um
Xen-ĭ-a′-trum
Xen-oc-ar′-pus
Xen-oph-on′-ta
Xe-ran′-dra*
Xe-ran′-them-um
Xe-ron-e′-ma
Xe-roph-yl′-lum
Xe-roph′-yt-a
Xe-ro′-tēs
Xim-en-e′-sĭ-a
Xim-en′-ĭ-a
Xiph-id′-ĭ-um*
xiph-ĭ-ŏ-i′-dēs
Xiph′-ĭ-on
Xiph-op′-ter-is
xiph-os′-tach-ys
xu′-tha
xyl-ac-an′-tha*
Xyl-a′-rĭ-a
Xyl-eb′-or-us
Xyl-ob′-ĭ-um
xyl-oc-ar′-pum
Xyl-om-e′-lum
Xyl-oph-yl′-la
xyl-oph-yl-lŏ-i′-dēs
Xyl-o′-pĭ-a
Xyl-op-ic′-ron
Xyl-os′-tĕ-um
xyl-ot′-rich-a
Xyr-id′-ĕ-æ
Xyr′-is
Xys-mal-ob′-ĭ-um
xyt-rĭ-oph′-or-a

Yc-cot′-li
yed-o-en′-sis
Young′-i
Young′-ĭ-æ
Young′-ĭ-a′-num
Young′-ĭ-i
Yp-on-om-eu′-ta

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Pronouncing Dictionary—*continued.*

Yuc'-ca
yuc-cæ-fol'-ĭ-a
yuc-cŏ-i'-dēs

Zab-uc-a'-jo
Zac-in'-tha
Zahn'-ĭ-i
Zal-ac'-ca
Zal-u-za'-nĭ-a
Zal-u-zi-an'-skĭ-a
Za'-mĭ-a*
za-mĭ-æ-fol'-ĭ-um
Za-mĭ-oc-ul'-cas
za-mor-en'-sis
Zan-nich-el'-lĭ-a
Zan-ted-esch'-ĭ-a
Zanth-orh-i'-za
Zanth-ox-yl'-ĕ-æ
Zanth-ox'-yl-um
zan-zib-a-ren'-sis
Zap-a'-nĭ-a
Za'-ra
Za-rab-el'-lĭ-a

Zausch-ner'-ĭ-a
Zav-i-a'-num
Ze'-a
Ze-bri'-na
Zed-o-a'-rĭ-a
Zeh-ner'-ĭ-a
ze-if-ol'-ĭ-a
Ze-nob'-ĭ-a
Zeph-yr-an'-thēs
Ze-rum'-bet
Zeux-i'-na
Zex-me'-nĭ-a
Zey'-her-i
zey-lan'-ic-um
zib-eth-i'-nus
Zi'-chy-a
Zier'-ĭ-a
Zie-te'-nĭ-a
Zig-a-de'-nus
Zil'-la
Zi-map-a'-ni
Zing'-ib-er
Zing-ib-er'-ĕ-æ
Zin'-nĭ-a
Zi-zan'-ĭ-a
Ziz'-ĭ-a

Zi-ziph'-or-a
Zi'-zyph-us
Zo-mic-ar'-pa
Zo-mic-ar-pel'-la
zo-na'-le
zo-na'-ta
Zo-og-lœ'-a
Zorn'-ĭ-a
Zo-ste'-ra*
zo-ste-ræ- ol'-ĭ-a
Zo-ste'-rĕ-æ
Zo-ste-ros'-tyl-is
Zoys'-ĭ-i
Zuc-cagn'-ĭ-a
Zuc-car-i-nĭ-a'-na
Zwing'-er-a
Zyg-ad-e'-nus*
Zyg'-is
Zyg-og-lōs'-sum
Zyg-om'-en-ēs
Zyg-om'-er-is
Zyg-op-et'-al-um
Zyg-oph-yl'-lĕ-æ
Zyg-oph-yl'-lum
Zyg-os-ep'-al-um
Zyg-os'-ta-tēs

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* This word is discussed at the end of the Pronouncing Dictionary.

The following Notes to the preceding alphabetical list deal, for the most part, with three classes of words.

I. Attention is drawn to those names of plants which are most frequently mispronounced in ordinary conversation. It will be as well to guard the reader against the supposition that there exists at present, for botanical names, any recognised standard of pronunciation, from which he may imagine that this Dictionary often presumes to depart. The fact is, that there is no such established standard: in many cases the common text-books are utterly at variance; and the usage, not only of good gardeners, but of educated botanists, is often hopelessly divergent. The aim of the present work, instead of being revolutionary, is eminently conservative, in that it seeks to revive and preserve good old ways that have partially fallen into disuse. At the same time it must be admitted that it is thoroughly radical, inasmuch as it insists on going to the *root* of matters. The combination of these two characteristics would substitute for a capricious anarchy a system of pronunciation founded upon antiquity and rational principles. This is chiefly apparent in two kinds of names.

In words of classical origin the ultimate criterion must be the manner in which such words were pronounced by the ancient Greeks and Romans. If they said, for example, *Anemō'-nē* (*ἀνεμώνη*), we must speak of *Anemō'-nē fulgens* and *Anemō'-nē nemorosa;* since in using these expressions we are simply giving the Latin phrases equivalent to the English "Shining Windflower" and "Wood Windflower." It is necessary, however, to bear in mind that the word "Anemone" has also passed into the English language, and in so doing shifted its accent and changed the sound of its vowels, as in so many similar instances. In this way, one might

Pronouncing Dictionary—*continued.*

quite correctly speak of "a wood anem′-ŏnĕ," or "anem′-ŏny," as it is sometimes written. The case is quite parallel to the Latin "orātor," which is in English "ŏrator." It would be just as gross a blunder to say "ŏrator" in a Latin quotation, as "orātor" when conversing in English. Mistakes frequently occur from forgetfulness of the simple fact that the generic and specific names of plants are Latin, not English, and are to be carefully distinguished from English words which may happen to be spelt in the same way and mean the same thing. The Latin *Al′-ŏ-ē* (from Greek, *ἀλόη*) in three syllables, and the English *Al′-oe* in two, give a good instance of this; and it may be well to add that *Sisymbrium Soph′-ĭa* is the correct pronunciation, in spite of the fact that the Vicar of Wakefield's lovely daughter was Sophī′-a Primrose. Of course, these remarks refer as well to the modern Latin compounds formed on classic analogy as to the words from the scientific vocabulary of the ancient writers which have survived unaltered in our own—*e.g.*, *anemōnifŏlius* is governed by the analogy of *Anemōne* and *fŏlium;* and must not be called (as it generally is) *anemŏnefōlius,* because we happen to be familiar with the English words "anemŏne" and "fōliage."

Again, in words commemorative of the names of men, it surely is well to pronounce each word as nearly as possible in the way in which the name to be commemorated was sounded. The opposite habit often causes the plant-name to be quite disassociated from the person in whose honour it was given. Mr. Britten ("Catholic Press," i., p. 440) puts this very pleasantly: "We all know something about dahlias and fuchsias, and have so far popularised each name as to mispronounce it; but who has heard of the Swedish botanist Dahl, or the German, Rembert Fuchs, in honour of whom the plants were named? Who thinks of Father Kamel, the Moravian Jesuit traveller of the seventeenth century, when he pins a camellia into his buttonhole? No one, surely, or we shouldn't almost always call it a camee′-lya." A few comments on the three well-known plant-names mentioned in this quotation will bring out the chief points concerning commemorative names which require notice. (*a*) *Dahlia:* In this case, the popular error is all the more unpardonable, as there is another plant, the Dalea (called after Dr. Samuel Dale), which ought to be pronounced exactly as the Dahlia too commonly is. (*b*) *Fuchsia:* Even the most accurate writers may sometimes make a slip—*quandoque bonus dormitat Homerus.* Plumier, the author of this name, associates it with "Leonartus Fuchsius" ("Plant. Americ. Genera," p. 14); Linnæus ("Critica Botanica," p. 92) gives Leonhard as the Christian name; and Hallam ("Literary History," i., p. 471) speaks of "Leonard Fuchs, who has secured a verdant immortality in the well-known Fuchsia." The other Fuchs was *Remacle,* a contemporary of *Rembert* Dodoens; and of him Mr. Boulger ("Natural History Notes," ii., p. 161) makes the Fuchsia commemorative. But if Plumier intended to keep green the memory of Leonhard, it is hardly fair that the honour should be appropriated by Remacle or another. This example shows how hard it is, even for writers well versed in botanical nomenclature, to be perfectly accurate when dealing with this difficult subject; and it may serve to excuse some of the errors which occur in these pages. (*c*) *Camellia:* It will be observed that the plant-name is not Kamelia, although it is called after Kamel. The reason of this is that the generic names are taken in many cases, not directly from the real names of the men after whom they were called, but from a Latinised or Græcised form of these names, which was commonly used at a time when Latin was the ordinary language for almost all scientific and theological works. The

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theologian Melancthon, whose Græcised appellation has almost entirely superseded his true name, Schwartzerd (black earth), is a familiar example. Among botanists, Dodoens becomes Dodonæus, and so fathers the *Dodonæa;* Kamel becomes Camellus, and is remembered (or, according to Mr. Britten, forgotten) in the *Camellia*; Jerome Bock (the he-goat) was considered to have such a hopelessly vulgar name that it was metamorphosed into Hieronymus Tragus, and from him the *Tragia* takes its name. It is strange indeed that so much of Fuchs is preserved in his name (as written, even if not as pronounced), since Fuchs (the fox) would naturally have become Alōpēx (*αλώπηξ*) or Vulpes, and produced *Alopecia* or *Vulpia*—forms which, as it happens, did afterwards occur. In fact, when Cornarius, a rival of Fuchs, published an attack upon him, he gave it the title of *Vulpecula excoriata,* "The foxling flayed." The instances adduced show that in the older names the Latinised form of the personal title was usually taken as the basis of the plant-name; but does it follow that the same operation ought to be performed at the present day, when men are quite content with their everyday patronymics, and never think of clothing them in classic garb? The pronunciation of ordinary modern names in such pedantic fashion often entirely obliterates (in sound) the connection between the man and the plant called after him. Why, for instance, should the modern Englishman, Dr. Stokes, be first transformed into the Roman *Stō-kē-sĭ-us,* and handed down to posterity in the *Stō-kē-sĭ-a,* when his memory would be much more fitly embalmed in the homely *Stokes-ĭ-a,* with three syllables instead of four? The same remark would apply to Mr. Sykes, a plant-collector commemorated by Walker-Arnott in the *Sykesia. Colquhoun-ia,* if pronounced as the proper name is in ordinary speech, is easy enough; but one trembles at the terrible combination which has to be uttered if it is supposed to have passed through a Latin stage, and each vowel must be assigned a separate value. The principle of preserving as much as possible the original sounds of proper names has been kept in view in the construction of this Pronouncing Dictionary. It has often given much difficulty in application, and led perhaps to inconsistent results; but it was felt that if "a verdant immortality" were to be conferred upon Dahl and Fuchs, there was no reason why it should be withheld from Sykes and Stokes. Besides *Sykesia, Stokesia,* and *Colquhounia,* other examples occur in the Notes, such as *Abelia, Aitonia, Listera,* and *Stanleya.*

II. Anyone who has run his eye down a botanical index, or even a garden catalogue, must have noticed what a very large proportion of the names are compounded from a few frequently recurring roots. It has been thought well to give a list of these Root-words, with examples appended. By a careful examination of this list, it will be possible for a person who has no acquaintance with Latin or Greek to pronounce correctly most of the names of classical derivation which he encounters, without having recourse to a Dictionary; since the same root often appears in a very large number of derivations, and when its sound has once been accurately ascertained, there can be no difficulty with the words of which it forms part. See, for example, in this Dictionary, the frequent repetition of the Prefixes călo-, chrȳso-, ĕrĭo-, măcro-, and the Suffixes -lĕpis, -lōma, -nēma, &c. Only those root-words have been given in the list which are likely to be mispronounced. There are, for instance, a large number of words beginning in crypto- and ending in -antha; but it is not probable that

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any one would in such cases vary from the correct pronunciation. References in the notes to the Greek root-words run as follows: "AC-ANTH-OC′-OM-A. *See* Cŏmē (hair)."

III. A few of the slips made in passing the sheets through the press have been corrected. In a work of this kind, for which so many references have to be made, and in which the result of considerable research is often expressed merely by altering the place of a single letter, it is impossible that errors difficult of detection should not creep in; especially as the task had to be done in the greatest haste. Indeed three times the period occupied would not have been too much, in which to carry out the design with the care and industry required for such an undertaking. The derivation of nearly fifteen thousand words had to be ascertained, where possible, in order to fix their pronunciation; and though that of the majority was obvious enough, occasionally a single word would require an amount of investigation entirely incommensurate with the apparent result. Since the Publisher was most anxious to keep faith with the public as to the date on which the parts should appear, each sheet, as soon as ever it was finished, was hastily carried off by the printers to be stereotyped, while it still would have much benefited by further revision. Doubtless some errors still remain; but it is hoped that they are not of sufficient importance to interfere with the value of the work as a standard of reference.

AB-A′-MA. One of the very puzzling names given by Michel Adanson; they are generally quite meaningless. *Ab-a′-ma* is given in ordinary type as a word of classical derivation, because it has been referred to *a* (ἀ) not, and *bāma* (βᾶμα) food (so also *Fedia*, which *see*, below); but most of Adanson's names will be found in italics, as barbarous, *e.g.*, *Tolpis* and *Vilfa*.

AB-EL′-Ĭ-A. Very frequently pronounced *Ab-e′-lĭ-a*; but, as it is called after Dr. Clarke Abel, the pronunciation given much more nearly represents the sound of the name which ought to be embodied in it.

AB-ROT′-AN-IF-OL′-Ĭ-UM. The termination *-folium* is by many persons sounded *fo′-lĭ-um*, although the Latin word for a leaf is *fol′-ĭ-um*.

AB-ROT′-AN-Ŏ-I′-DĒS. *-oides* at the end of botanical names is very commonly pronounced "oydes," in two syllables—a gross mistake, as it is merely a reproduction of the Greek *ŏ-ī-dēs* (οειδης). *See* Eīdŏs or īdŏs (appearance). The termination *ēs* (ης) in an adjective (specific name) becomes *ĕs* (ες) when the substantive (generic name), with which it agrees, is neuter.

AC-ANTH-OC′-OM-A. *See* Cŏmē (hair).

AC-ANTH-O′-DĒS. The termination *-ōdes* (ωδης) is a contraction of *ŏ-ī-dēs*, which has been dealt with under abrotanoides, above.

AC-ANTH-OL-I′-MŌN. *See* Leimōn or līmōn, līmōnŏs (a meadow).

AC-ANTH-ORH-I′-ZA. *See* Rhīza (a root).

AC-ANTH-OST-ACH′-Y-UM. *See* Stăchўs, stăchyŏs (an ear of corn).

AC-EPH′-AL-A. *See* Cĕphălē (a head).

Ac′-ER. *Acer*, a Maple, has the *a* short—*Ăcer*; but in *acer*, sharp, pointed, the *a* is long—*ācer*. (*Compare* a′-crĕ, below.) Hence the old memorial line: "*Est ăcer in sylvis, equus ācer Olympia vincit.*"

AC-IN-E′-TA. *Read* Ac-i-ne′-ta (ἀκίνητος, unmoved).

AC-IN-O′-TUS. *See* Ăcīs (a point) and Nōtŏs (a back).

AC-IPH-YL′-LA. Words ending in *-phyllus, a, um*, are to be carefully distinguished in pronunciation from those in *-philus, a, um*: the former are always to be accented on the last syllable but one, as *ac-iph-yl′-la*, the latter on the last syllable but two, as *Æg-iph′-il-a*.

AC-IS-AN-THE′-RA. *See* Anthēra (an anther).

AC-ON-Ĭ-OP′-TER-IS. *See* Ptĕrĭs, ptĕrĭdŏs (a fern).

A′-CRE. The *a* long for *ācer*, sharp, pointed. *See* Ac′-er, above

AC-ROC′-LAD-ON. *See* Clădŏs (a branch).

AC-ROC-LI′-NĬ-UM. *See* Clīnē (a couch).

AC-ROP-E′-RA. *See* Pĕră (a wallet).

AC-ROPH′-OR-US. *See* Phŏrŏs (bearing, producing).

AC-ROS′-TICH-UM. *See* Stĭchŏs (a row, line).

AC-ROT′-RICH-E. *See* Thrix, trĭchŏs (hair).

Ac′-TI-NOL′-EP-IS. *See* Lĕpĭs, lĕpĭdŏs (a scale).

Ac′-TI-NOM′-ER-IS. *See* Mĕrĭs, mĕrĭdŏs (a part).

AC-TI′-NON-E′-MA. *See* Nēmă, nēmătŏs (a thread).

AC-U′-TIF-LO′-RA. The termination *-florus, a, um* (from *flos, flōris*, a flower), ought to have the *o* always long; although it is given as *-flŏrus* by the same class of authorities which advocate the pronunciation *-fōlius*. *See* abrotanifolium, above.

AC-U-TIL′-OB-A. *See* Lŏbŏs (a lobe).

AD-E′-LOB-OT′-RYS. *See* Bŏtrўs, bŏtrўŏs (a cluster).

A-DEN′-Ĭ-UM. From Aden in Arabia, hence with the *a* long, and so distinguished from the compounds of *ădēn* (ἀδήν), a gland.

AD-E-NOP-OD′-Ĭ-A. The compounds of *ădēn, ădĕnŏs* (ἀδήν, ἀδένος), a gland, have been given throughout this Pronouncing Dictionary with the *e* long, in accordance with general usage; but it would be more correct to pronounce the *e* short, as the stem is *ădĕn*, as seen in ἀδένος.

AD-E-NOST′-OM-A. *See* Stŏmă, stŏmătŏs (the mouth).

ÆG-IPH′-IL-A. *See* Phĭlŏs (fond); and *compare* Aciphylla, above.

AG-A′-VE. Often mispronounced as a dissyllable, *A-gave*; but it has three syllables, as the equivalent of the Greek *ag-au-e* (ἀγαυή), illustrious.

AG-E′-RAT-UM. Most people talk of an "Aj-er-ay′-tum," but the word is the Greek *Agĕrăton* (ἀγήρατον).

AG-ROP-Y′-RUM. *See* Pўrŏs (Wheat).

AG-RO′-STIS. The *o* is long, as the word is a reproduction of the Greek *Agrōstis* (ἄγρωστις).

AI-TO′-NĬ-A. The *o* would perhaps be better short, as coming from Aitŏn. *See* discussion on preceding page.

A-I-ZO′-ON. This word has four syllables, since it is a compound of the Greek *a-ī* or *a-ei* (ἀεί), always, and *zō-os* (ζωός), living.

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AJ-U'-GA. Given by Lindley and others as *Aj'-ug-a*; but the old Latin word is *Aj-u'-ga*. *See* White and Riddle, also Lewis and Short, *sub voc.*

AL-BO-SPI'-CA The Latin word *spīca*, a spike, an ear of corn, frequently recurs in botanical names.

AL-BO-STI'-PES. From the Latin word *stīpes, stīpitis*, a trunk. *stipitatum* has the same derivation.

AL-EC-TOR-OL'-OPH-US. *See* Lŏphŏs (a crest).

ALL-OS-O'-RUS. *See* Sōrŏs (a heap).

AL'-Ŏ-E. The word comes from the Greek *Al-ŏ-ĕ* (*ἀλόη*); so that each of the three syllables is to be pronounced distinctly, not as in the English aloe, which has only two syllables. *See* p. 347.

AM-BLY'-OD-ON. *See* Ŏdous, ŏdŏntŏs (a tooth).

AM-MOB'-Ĭ-UM. *See* Bĭŏs (life).

AM-MOCH'-AR-IS. *See* Chărĭs, chărĭtŏs (grace, beauty).

AM-MOG-E'-TON. *See* Geitōn or gētōn (a neighbour).

AM-PHIL-OB'-Ĭ-UM. *See* Lŏbŏs (a lobe).

AM-PHOS-TE'-MŌN. *See* Stēmōn, stēmŏnŏs (the warp, a stamen).

AN-CYC-LOG'-YN-E. *See* Gynē (a woman).

AN-DROP-O'-GŌN. *See* Pōgōn, pōgōnŏs (a beard).

AN-DROS'-AC-E. The termination *săc-e*, from Greek *săcŏs* (*σάκος*), a shield, should not be pronounced like the English "sake," as it sometimes is.

AN-DROS-TEPH'-Ĭ-UM. *See* Stĕphŏs (a crown).

AN-E'-MĬ-A. This word, coming from the Greek *aneimōn* (*ἀνειμών*), naked, has the *e* long: so that, with its compounds, it is to be distinguished from *Anĕmōne*, and the compounds of that word.

AN-EM-O'-NE. In Greek Anĕmōnē (*ἀνεμώνη*). *See* p. 346.

AN-IS-ANTH'-US. From *anīsŏs* (*ἄνισος*), unequal, to be distinguished from *anīsŏn* (*ἄνισον*), Anise, which appears in *Anīsum* and *anīsata*.

AN-IS-OG-O'-NĬ-UM. *See* Gōnĭa (an angle).

AN-I'-SUM. From the Greek *Anīsŏn* (*ἄνισον*), Anise. *Compare* Anisanthus, above.

AN-ŒC'-TOCH-I'-LUS. *See* Cheilŏs, or chīlŏs (a lip).

AN-OM-ATH-E'-CA. *See* Thēcē (a case, sheath)

AN-OP-LOPH'-YT-UM. *See* Phytŏn (a plant).

ANTH'-EM-IS. The Greek *Anthĕmis* (*ἀνθεμίς*), and therefore not to be pronounced "An-thee-mis," as given in a treatise on plant-names.

ANTH-OL-O'-MA. *See* Lōmă, lōmătŏs (a border, fringe).

AN-TIG-O'-NON. Endlicher's *Antigonon* is the same as A. Jussieu's *Antigonium*, from *gōnĭa* (*γωνία*), an angle.

AP'-Ĭ-UM. The first syllable is short, though very frequently pronounced long. The correct quantity is shown in the line of Horace: "*Neu vivax āpium, neu breve līlium.*"

AP-OC'-YN-UM. *See* Cynōn, cynŏs (a dog).

AR'-AB-IS. The medial *a* is short, and is generally pronounced so, in spite of the "Ar-ray-bis" given in one book on plant-names.

AR-A-NIF'-ER-A. The very frequently recurring Latin termination *-fera*, bearing or producing, has the *e* short. *Compare* Phŏrŏs (*φορός*).

AR'-BUT-US. Very often mispronounced *Arbūtus*; but the *u* is certainly short, as in Virgil's line, "*Dulce satis humor, depulsis arbŭtus hœdis.*"

ARC-TOS-TAPH'-YL-OS. *See* Staphylē (a cluster of grapes).

AR-GEM-O'-NE. Not *Argemōne*, but *Argemŏne* (*ἀργεμώνη*), the name used by Dioscorides.

AR-GOS'-PATH-A. *See* Spathē (a blade, flower-sheath).

AR-IS'-TOL-OCH'-Ĭ-A. Although this word is often pronounced *Aristolōchia*, the last *o* is short, as it comes from the Greek *Aristŏlŏchia* (*ἀριστολοχία*).

AR-IST-OT'-EL-A. Not *Aristotēla*, as often given, since it comes from the Greek *Aristŏtĕlēs* (*Αριστοτέλης*), Aristotle.

AR-O-NI'-CUM. Altered from *Doronicum* (which *see*), therefore with the *o* and *i* long.

ARTH-ROP-OD'-Ĭ-UM. This word and those of similar termination should not be pronounced as if they ended in *-poe-di-um*, but *-pŏdium*. *See* Pous or pūs, pŏdŏs (a foot).

AR-VIC'-OL-A. The Latin termination *-cola*, an inhabitant, has the *o* short, as in *Viti-cola, Eremi-cola*.

AS-CAR-IC'-ID-A. This word and *An-guic'-id-a* ought to have been given as *As-car-ic-i'-da* and *An-guic-i'-da*, as the Latin termination *-cida*, a slayer, has the *i* long, *e.g.*, *homicida*.

AS-COM-YC-E'-TĒS. *See* Mycēs, mycētŏs (a mushroom).

AS-PHOD'-EL-US. Often mispronounced *Asphodēlus*; it comes from the Greek *Asphŏdĕlŏs* (*ἀσφόδελος*).

AS'-TĒR. *Delete* the long mark over the *e*. The word is the Greek *Astēr* (*ἀστήρ*); but in Latin it becomes *Aster*, with the *e* doubtful.

AS-TROC-AR'-Y-UM. *See* Cărўŏn (a nut, fruit-stone).

AS-TROL-OB'-Ĭ-UM. *See* Lŏbŏs (a lobe).

AS-TROPH'-YT-UM. *See* Phytŏn (a plant).

ATH-E-RU'-RUS. *See* Oura or ūra (the tail).

AU'-CUB-A. Wittstein and Glaser give *Aucūba*, which seems to be the sound expressed in the "Cuba" of many gardeners; but Lindley (in Paxton) gives *Aucŭba*, as the word is now generally pronounced.

AZ-AL'-Ĕ-A. Although generally pronounced *Azālea* the medial *a* is short, as coming from the Greek *Azălĕŏs* (*ἀζαλέος*), dry. Lindley gives it correctly.

BEL-OP-ER'-ON-E. *See* Bĕlŏs (a dart).

BĬ'-OT-A. From the Greek *Biŏtē* (*βιοτή*), life, and given with the *o* short by Glaser, &c.; but generally pronounced *Biōta*.

BLEPH'-AR-IG-LŌT-TIS. *See* Blĕphărĭs (an eyelash).

BRACH-YCH-I'-TON. *See* Brăchўs (short) *and* Chĭtōn, chĭtōnŏs (a tunic).

BRACH-YS-E'-MA. *See* Brăchўs (short) *also* Sēma and Sēmeiŏn (a mark).

BRACH-YS'-PATH-A. *See* Brăchўs (short) *and* Spathē, (a blade, flower-sheath).

BREV-IS-CA'-PA. The Latin word from which the termination is derived is *scāpus*, a trunk, the same as the Greek *scāpŏs* (*σκᾶπος*).

BREV-IS-E'-TA. The Latin *seta*, a bristle, has the *e* long, as in *sētacea, sētigera, sētosa*, &c.

BROM'-US. The Greek name of this Grass is Brŏmŏs (*βρόμος*); but the generic name is often pronounced *Brōmus*, as if from *brōma* (*βρῶμα*), food.

BRŸ'-A. *Read Bry'-a*—the first syllable long—as a name commemorative of De Bry, and therefore to be pronounced differently from *Brўanthus*, &c., from the Greek *brўo* (*βρύω*), I grow.

BU-GLOS'-SUM. *See* Būs (an ox, a bull) *and* Glōssa (a tongue).

BUL-BOS'-TYL-IS. *See* Stўlŏs (a pillar, style), and *compare* the note on Stylandra, below.

BU'-TOM-US *See* Būs (an ox, a bull) *and* Tŏmē (a cut).

CAL'-Ĕ-A. *See* Călŏs (beautiful).

CA-LE-A'-NA. To be distinguished from *Călea*. The first *a* is long, as the word is derived from the proper name Caley.

CAL-IPH-RU'-RĬ-A. The *u* is long, as the word is derived from *phrūra* (*φρουρά*), a guard.

CAL-LICH'-RŌ-A. *See* Chrōă (colour).

CAL-LIP-RO'-RA. The *o* long, from *prōra* (*πρῷρα*), a prow.

CAL-LIP-SY'-CHE. *See* Psychē (the soul, a butterfly).

CAL-LIS-TEM'-MA. *See* Stemma, stĕmmătŏs (a wreath).

CAL-LIS-TE'-MŌN. Words derived from Stēma and Stēmōn (a stamen) are to be distinguished from those derived from Stĕmma. *Compare* Calli temma, above.

CAL-OD-IC'-TŸ-ON. *See* Dictўŏn (a net).

CAL-OD'-RAC-ON. *See* Drăcōn, drăcŏntŏs (a dragon).

CAL-OG-LŌS'-SA. *See* Glōssa (a tongue).

CAL-OPH'-AC-A. The *a* short, from *phăcē* (*φακῆ*), a lentil; not *phāca*, as given by McNicoll and Glaser.

CAL-YC-OT'-OM-E. *See* Călўx, călўcŏs (a covering, calyx), *and* Tŏmē (a cut).

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CAL-YP-TROC′-AL-YX. *See* Călўx, călўcŏs (a covering, calyx).

CAL-YP-TRON′-OM-A. *See* Călўptra (a veil).

CAL-YS-TEG′-Ĭ-A. *See* Stĕgē (a covering).

CAL-YX′-HY-MEN′-Ĭ-A. *See* Hўmēn, hўmĕnŏs (marriage).

CAM-EL′-LĬ-A. A word subject, in the matter of pronunciation, to very hard usage, which sometimes goes so far as to give it the sound of "Camilla." It is fully discussed on pp. 347-8.

CAM-E-LO′-RUM. The long *e*, which is often wrongly introduced into *Camellia*, properly belongs to this word, from Latin *camelus* (Greek *κάμηλος*), a camel.

CAP-ROX′-YL-ON. *See* Xўlŏn (wood).

CAR-PI′-NUS The *i* ought not to be pronounced short, as it often is.

CAS-SUM-U′-NAR. This word should be italicised.

CAS-TAN′-Ĕ-A. The medial *a* short, from Greek *Castăna*, (*κάστανα*); yet the pronunciation is given in one book as "Kas-tay-nē-ah."

CED′-RUS. The *e* better short, from the Greek *Cĕdrŏs* (*κέδρος*), although in Latin the quantity of the vowel is doubtful.

CE-LAS′-TRUS. The *e* long, from the Greek *Cēlastros* (*κήλαστρος*).

CE-LO′-SĬ-A. Long *e*, from the Greek *cēleos* (*κήλεος*), dry, burned.

CEPH-AL-AN-THE′-RA. *See* Anthēra (an anther).

CER-AT′-Ĭ-OL-A. The *o* is short, as the word is a diminutive from *Ceratia*. *Compare* Gladiolus, below.

CER-AT-OD-AC′-TYL-IS. *See* Cĕrăs, cĕrătŏs (a horn), *and* Dactўlŏs (a finger).

CER-COS′-POR-A. *See* Spŏră (a seed).

CE′-RĔ-US. A Latin word of three syllables, meaning waxen; often pronounced "Sear-use," in two syllables.

CHAM-Æ-BAT′-I-A. *See* Chămæ (on the ground, dwarf).

CHEIL-ANTH′-ĒS. *See* Cheilŏs or chīlŏs (a lip). *Compare also* Chilognatha, below, for the other form of the prefix.

CHEIR-ANTH′-US. *See* Cheir or chīr, chīrŏs (a hand), and *compare* Chiromyces, below, for the other form of the prefix.

CHEIR-OG-LŌS′-SA. *See* Glōssa (a tongue).

CHEL-I-DON′-Ĭ-UM. The Greek word for this plant is *Chelīdŏnion* (*χελιδόνιον*), from *chelīdōn, chelīdŏnŏs* (*χελιδών, χελιδόνος*), a swallow.

CHEL-O′-NE. The Greek *chĕlōnē* (*χελώνη*), a tortoise.

CHE-NOP-OD′-Ĭ-UM. From *chēn* (*χήν*), a goose, and *Pous, pŏdŏs* (a foot), which *see*.

CHIL-EN′-SE. The *ch* to be pronounced soft, and the *i* short (from *Chili*), and so distinguished from *chil*, with hard *ch* and long *i*, in classical compounds.

CHIL-Ĭ-AN′-DRA. *Read* Chi-lĭ-an′-dra; *also* Chi′-lĭ-oph-yl′-lum. The words come from *Chīlioi* (*χίλιοι*), a thousand.

CHIL-O′-DĬ-A. *Read* Chi-lo′-dĭ-a. Same derivation as

CHI′-LOG-NATH′-A. *See* Cheilŏs or chīlŏs (a lip).

CHIM′-Æ-RA. *Chimæra* (*χίμαιρα*), a she-goat, has the first syllable short, and so is to be distinguished from the compounds of *chima*, such as the word which follows.

CHI-MAPH′-IL-A. *See* Cheima or chīma, chīmătŏs (cold, winter).

CHI-MON-ANTH′-US. *Read* Chi-mo-nanth′-us, as it comes from *chīmōn, chīmōnos* (*χείμών, χειμῶνος*), winter.

CHĬ-O-NANTH′-US. *Read* Chĭ-on-anth′-us. *See* Chĭōn, chĭŏnŏs (snow).

CHI-ROM′-YC-ĒS. *See* Cheir or chīr, chīrŏs (a hand), *and* Mўcēs, mўcētŏs (a mushroom).

CHIT-O′-NĬ-A. *See* Chĭtōn, chĭtōnŏs (a tunic).

CHLAM-YD′-Ĭ-A. *See* Chlămўs, chlămўdŏs (a cloak).

CHLŌ-ANTH′-ĒS. *See* Chlŏă (grass).

CHLO′-RA. *See* Chlōrŏs (green).

CHRO-MAT-EL′-LA. *See* Chrōmă, chrōmătŏs (colour).

CHRY-SANTH′-EM-UM. *See* Chrўsŏs (gold) *and* Anthĕmŏn (a flower).

CHRY-SOB-AL′-AN-US. *See* Bălănŏs (an acorn).

Pronouncing Dictionary—*continued.*

CHRY-SOG′-ON-UM. *See* Gŏnŏs (offspring).

CHRY-SOM′-EL-AS. *See* Mĕlăs, mĕlănŏs (black).

CHRY-SOS-TEPH′-AN-A. *See* Stĕphŏs and Stĕphănē (a crown).

CIL-Ĭ-A′-RĬ-A. From the Latin *cĭlĭum*, an eyelash.

CLAD′-Ĭ-US. *See* Clădŏs (a branch).

CLE′-MAT-IS. Often called *Clem-a′-tis*, sometimes *Clem′-at-is*; but the true pronunciation is plainly that given here, since the word is the Greek *Clēmătis* (*κληματίς*).

CLI-NOP-OD′-Ĭ-UM. The Greek word is *Clĭnŏpŏdĭon* (*κλινοπόδιον*). *See* Clīnē (a couch) *and* Pous or pūs, pŏdŏs (a foot).

CNE-MI′-DĬ-A. From *cnēmis, cnēmīdos* (*κνημίς, κνημῖδος*) a legging. *See* Cnēmē (the leg).

CNI′-DĬ-UM. From *Cnīdē* (*κνίδη*), a Nettle. *Compare* Eu-cni′-de, below.

CO-DO′-NĬ-UM. *See* Cōdōn, cōdōnŏs (a bell).

COL′-Ĕ-US. A word of three syllables (the first short), from the Greek *coleos* (*κολεός*), a sheath—not to be pronounced, as it often is, "Coal-use."

COLQU-HOUN′-Ĭ-A. The name Colquhoun is pronounced "Cohoon." This word is discussed on p. 348.

CO-NAN′-DRON. *See* Cōnŏs (a cone).

CO-NI′-UM. From the Greek *Cōnīon* or *Cōneion* (*κώνειον*), Hemlock.

COR-YN-OC-AR′-PUS. *See* Cŏrўnē (a club).

CRAS-PED-A′-RĬ-A. From the Greek *craspedon* (*κράσπεδον*), a fringe.

CRE′-PIS. The *e* is long, as the word is the same as the Greek *crēpis* (*κρηπίς*), a boot. The Greek stem is *crēpīd* (*κρηπῖδ*); but in Latin the quantity of both syllables is changed, and we have *crĕpĭda*, a slipper.

CRI-NIF′-ER-A. This, and the two words which follow on p. 293, come from the Latin *crīnis*, hair, and are distinguished by the length of the first syllable from the compounds of *Crĭnon*.

CRIN-OD-EN′-DRON. From *Crĭnŏn* (*κρίνον*), a Lily.

CROC′-US. The Latin *Crŏcus* of Virgil: "*Et glaucas salices, casiamque, crŏcumque rubentem.*" The Greek *Crŏcŏs* (*κρόκος*) of Homer: "*Λωτόν θ' ἑρσήεντα ἰδὲ κρόκον ἠδ' ὑάκινθον.*"

CROT′-ŌN. The Greek *crŏtōn* (*κροτών*), a tick.

CRUC-Ĭ-AN-EL′-LA. This and other compounds of *crux, crŭcis*, have the *u* short.

CRYP-TOC′-OP-IS. The second part of the compound is the Greek *cŏpis* (*κοπίς*), a knife.

CUS-CU′-TA. The authorities are much divided as to the pronunciation of this word; but the *Cuscūta* of Alcock, Glaser, and "Index to English Botany," seems nearer to the Arabic *chasuth* or *kechout* than the *Cuscŭta* of many others.

CŸ′-AM-US. The Greek *cўamos* (*κύαμος*), a bean. *Compare* Hyoscyamus, below.

CŸ-AN′-US. *See* Cўănŏs (dark blue).

CY-ATH′-Ĕ-A. *See* Cўăthŏs (a cup).

CY′-CLAM-EN. The quantity of the *y* in the Greek *cyclos* (*κύκλος*), a circle, is doubtful; so that the common gardener's abbreviation "Sўkes," for Cyclamens, has just as much authority as the "Sickly-men" of others.

CYN-ANCH′-IC-A. *See* Cўōn, cўnŏs (a dog).

CYN-OC′-TON-UM. *See* Ctŏnŏs (a murder).

CYP-E′-RUS. Often pronounced *Cўpĕrus*, which has the authority of the form given by Herodotus. *Cўpĕrŏs* (*κύπερος*), but more correctly *Cўpērus*, from the ordinary form *Cўpeiros* (*κύπειρος*).

CY′-PHĬ-A. *See* Cўphŏs (bent, round).

CYP-RIP-ED′-Ĭ-UM. Pronounced by most people *Cypripēdium*; but the termination coming from the Greek *pĕdĭŏn* (*πεδίον*) or *pŏdĭŏn* (*πόδιον*), the *e* ought to be short.

DAC′-TYL-IC-AP′-NOS. *See* Dactўlŏs (a finger).

DAH′-LĬ-A. This word ought to have the first syllable sounded like the English "ah," not as "day," since it is commemorative of Dahl. *See* p. 347.

Pronouncing Dictionary—*continued.*

DA′-LĔ-A. The *a* to be pronounced as in "day," as the genus is called after Dr. Samuel Dale. *See* p. 347.

DA′-NĂ-A. This word, called after Dana, has the first syllable long; but *Dan′-ă-ĕ*, after the Greek heroine of that name, has the same syllable short.

DAS-Ŷ-ANTH′-A. *See* Dăsÿs (thick, hairy).

DEC-AB-EL′-ON-E. *See* Dĕcă (ten).

DEC-US-SA′-TA. The first syllable is short, as containing the stem of *decem*; while the neighbouring words *decumbens*, *decurrens*, &c., have the same syllable long, since it is formed from the preposition *de*.

DEL-PHI′-NĬ-UM. The Greek *Delphĭnŏn* (Δελφίνιον), from *delphis*, *delphīnos* (δελφίς, δελφῖνος), a dolphin.

DEN-DROM-E′-CŌN. *See* Mēcōn, mēcōnŏs (a poppy).

DICH-Æ′-A. *See* Dĭchă (in two, asunder).

DIC-LYT′-RA. In reality a misprint for *Dicentra*; but it is best pronounced after the analogy of *Dielytra*, a guess-etymology, which is generally substituted for it.

DIC-TŸ-OG-RAM′-ME. *See* Dictyŏn (a net.)

DID-YM-OC-AR′-PUS. *See* Dĭdўmŏs (twin).

DI-EL-YT′-RA. From *ĕlўtron* (ἔλυτρον), a sheath. *See* Diclytra, above.

DIG-IT-A′-LIS. From the frequently recurring *dĭgĭtus*, with the same meaning as the Greek *dactylos*.

DI-OS′-PYR-OS, of Pliny, a rendering of the Greek *διόσπυρος* of Theophrastus, is given in the dictionaries *Diospўros*; but *see* Pўrŏs (Wheat), and *compare* Agropyrum, above.

DIPH-Y′-SA. *See* Phўsa (a bladder, bellows). Lindley (in Paxton) incorrectly gives it as *Diphўsa*.

DIS-AR′-REN-UM. *See* Arrhēn, arrhĕnŏs or arrĕnŏs (a male).

DO-DEC-AN′-DRA. From *dōdĕca* (δώδεκα), twelve. *See* Dĕcă (ten).

DOL-ICH-OC-EN′-TRA. *See* Dŏlĭchŏs (long).

DO-RO-NI′-CUM. The word comes from the Arabic *doronigi*; but Linnæus gives the pronunciation by deriving it from *dōron* (δῶρον), a gift, and *nīce* (νίκη), victory. Glaser and others give it *Doronĭcum*; Lindley rightly makes the *i* long.

DOR-Ŷ-ANTH′-ĒS. From *dŏrў* (δόρυ), a spear.

DRAC′-O. *See* Drăcōn, drăcōntŏs (a dragon).

DREP-AN-OC-AR′-PUS. From *drĕpănē* (δρεπάνη), a sickle.

DRI′-MĬ-A. From *drīmўs* (δριμυς), sharp, keen.

DRU-PA′-CĔ-A. This and the three following words on p. 297 from the Latin *drūpa*, a kind of fruit.

DRŸ-OB-AL′-AN-ŌPS. *See* Drўs, drўŏs (an oak).

ECH-I-NANTH′-US. *See* Ĕchīnos (a hedgehog).

ECH-Ĭ-O-GLŌS′-SUM. The *o* in *echĭŏ-* ought to be short. *See* Ĕchĭs, ĕchĭŏs (a viper, an adder).

EL-AT-I′-NĒS. From the Greek *Ēlătine* (ἐλατίνη).

E-LA′-TĬ-OR. The Latin *ēlātus*, lofty; note the difference from the preceding in the first two syllables.

ER-E′-MĬ-A. *See* Ĕrēmŏs (desert, solitary).

ER′-Ĭ-A. *See* Ĕrĭŏn (wool).

ER-I′-CA. Generally pronounced *Erĭca*; but it ought certainly to have the second syllable long, as it comes from the Greek *Ērīcē*, or *Ēreicē* (ἐρείκη).

E-RIG′-ER-ŌN. The Greek *Ērĭgĕrōn* (ἠριγέρων), from *ēri* (ἦρι), early, and *gĕrōn* (γέρων), old.

E-RIN-A′-CĔ-A. The Latin *ērĭnaceus*, a hedgehog. To be distinguished from the next by the quantity of its first two syllables.

ER-I′-NĔ-UM From *Ērīneos* (ἐρινεός), a wild Fig-tree.

ER-YS-I′-PHE. *Compare* Er-is-y′-phe: both words are forms of the Greek *ĕrўsībe* (ἐρυσίβη), mildew.

ER-YTH-ROR′-ACH-IS. *See* Ĕrўthrŏs (red).

EU-CHRO′-MA. *See* Chrōmă, chrōmătŏs (colour).

EU-CNI′-DE. From *Cnīdē* (κνίδη), a Nettle. *Compare* Cni′-dĭ-um.

EU-O′-NYM-US. The Greek *euōnўmŏs* (εὐώνυμος), lucky.

EU-PHLEB′-Ĭ-A. *See* Phlĕps, phlĕbŏs (a vein).

EU′-SCAPH-IS. *See* Scăphē or Scăphis (a boat, skiff).

Pronouncing Dictionary—*continued.*

EX-O-GON′-Ĭ-UM. The *o* short, in accordance with the derivation from *gŏnŏs* (γόνος), begetting; not as *Anisogōnium*, from Gōnĭa (an angle), which *see*.

FE′-DĬ-A. One of Adanson's names (*see* note on Abama, above). The present word has been supposed to come from *fēdus*, an old form of the Latin *hœdus*, a kid.

FIL′-IC-ĒS. The compounds of *fĭlix*, *fĭlĭcis*, a fern, are to be distinguished from those of *fīlum*, a thread.

FI-LIF-OL′-Ĭ-UM. The first syllable long, as the word means "thread-leaved," to be distinguished from *fĭlicifolia*, fern-leaved.

FLA-BEL-LA′-TA. From *flăbellum*, a fan.

FLAG-EL-LA′-RIS. The first syllable is short, from *flăgellum*, a whip.

FLA′-VA. This and several words following have the first syllable long, coming from *flāvus*, yellow.

FLO′-RID-A. The Latin *flōrĭdus*, blooming, from *flos*, *flōris*. *See* note on acutiflora, above.

FLOR-ID-A′-NUM. The first syllable not to be pronounced as in *flo′-ri-da*, since this word is derived from Florida, one of the United States.

FOL′-Í-I. *See* note on abrotanifolium, above.

FRA-GA′-RĬ-A. From the Latin *frăga*, a strawberry, akin to *frūgrans*.

FROL-O′-RĬ-A. Delete: a misprint for the following word, *Frolovia*.

FRUT-ES′-CA. The first syllable in this and the five words which follow on p. 301 is short, though often pronounced long—*frŭtex*, not *frūtex*, &c.

FUCH′-SĬ-A. See p. 347. The part of the word in italics ought to be pronounced like the German word *fuchs*, a fox. Those to whom this does not convey much information may sound the word rather as "Fook′-sĭ-a" than "Few-shah," as we generally hear it. The evil effect of the mispronunciation is seen in the very frequent mis-spelling of the word. Nine times out of ten, people write it *Fuschia*, and compositors frequently set it up in the same way.

FU-SIF-OR′-MIS. The first syllable long, from the Latin *fūsus*, a spindle.

GAL-AC′-TĬ-A. *See* Gălă, gălactŏs (milk).

GAL-E′-DUP-A. This word should be italicised.

GAL-PHI′-MĬ-A. An anagram of *Mal-pi′-ghĭ-a*, and to be pronounced in a similar way.

GEM-IN-A′-TA. From Latin *gĕmĭnus*, with the same meaning as Greek *dĭdўmŏs* (twin).

GER-AN′-Ĭ-UM. The second syllable is short. The Greek is *Gĕrănĭon* (γεράνιον), from *gĕrănŏs* (γέρανος), a crane.

GER-OP-O′-GŌN. From *gĕrōn gĕrŏntŏs* (γέρων, γεροντος), an old man, and Pōgōn (a beard), which *see*.

GES-NE′-RA. So Lindley, Wittstein, Glaser, Leunis, &c. The word is frequently pronounced *Gesnĕra*.

GLAB-EL′-LA. The first syllable short, from Latin *glăber* (bald).

GLAD′-Ĭ-OL-US. This word used to be pronounced *Glad-ĭ-o′-lus*; lately the "fashionable" pronunciation has been *Glad-ī′-ol-us*, which is quite as incorrect as the former. *Glad′-ĭ-ol-us* is the Latin name used by Pliny, and is a regularly formed diminutive from *gladius* (a sword).

GLŌS-SAN′-THUS. *See* Glōssa (a tongue).

GLYC-YR-RHI′-ZA. *See* Glўcўs (sweet) and Rhīza (a root).

GRA-NA′-TUM. The first syllable is long (from Latin *grānum*, grain), and the word is to be distinguished from *gran-a-ten′-se*, a geographical name, which precedes it.

GUN-NE′-RA. So Lindley, Wittstein, Glaser, &c. *Gunnĕra* is the common pronunciation.

GYN-AN-DROP′-SIS. *See* Gўnē, gўnaikos (a woman).

GY-RAN′-DRA. *See* Gўrŏs (curved, round).

HE-BE-AN′-DRA. *See* Hēbē (youth).

HE′-DŸ-A. *See* Hēdўs (sweet).

HEL-Ĭ-AM′-PHOR-A. This word, which comes from the same root as *Hēlicodea*, &c., is not to be confused with *Hēlianthemum* and others coming from *hēlios*.

Pronouncing Dictionary—*continued.*

HE-LĬ-ANTH′-US. *See* Hēlĭŏs (the sun).

HĔL-LEB′-OR-US. The Greek form is *Hĕllēbŏros* (ἑλλέβορος). A modern book, which professes to teach the pronunciation of English plant-names, gives the sound as "Hellie-boar-us"!

HE-MER-OB-Ĭ-EL′-LA. *See* Hēmĕrā (the day).

HĔ-MĬ-AND′-RA. *See* Hēmĭ (half).

HES-PER-AN′-THA. *See* Hĕspĕrŏs (evening).

HET-ER-AC-AN′-THA. *See* Hĕtĕrŏs (another, different).

HET-ER-OPH-LEB′-Ĭ-UM. *See* Phlĕps, phlĕbŏs (a vein).

HI-MA-LAY-A′-NA. The correct pronunciation of the mountains popularly known as Himălāya is given by the best authorities (*e.g.*, Sir W. W. Hunter) as Himālăya (=*Himāchăl*, snow-mountain).

HOL-OCH-RY′-SUM. *See* Hŏlŏs (whole, perfect).

HOM-AL-ANTH′-US. *See* Hŏmălŏs (even, smooth).

HOM-AL-OM-E′-NA. An altered form of *Homalonēma*, and therefore to be pronounced in a similar manner.

HY-BER′-NĬ-A. From *hȳbernus* (better *hībernus*), winter. *Hibernicus* (Irish) has the first syllable short.

HYD-RAN′-GĔ-A. The quantity of the first syllable is doubtful, and the *e* of the penultimate would, in strict accuracy, be long, as coming from the Root-word Angeion, or Angīon (a vessel), which *see*.

HYD-ROC-OT′-YL-E. *See* Hȳdōr, hȳdătŏs (water).

HYM-EN-Æ′-A. *See* Hȳmēn, hȳmĕnŏs (marriage).

HŸ-OS′-CŸ-AM-US. *See* note on Cȳamus *and* the root-word Hȳs, hȳŏs (a pig). The word means Hog's-bean.

HYP-ER-ANTH-E′-RA. *See* Hȳpĕr (above, superior).

HYP-ER′-IC-UM. The Greek form, as found in Dioscorides, is *Hyperīcon* (ὑπέρεικον). So Pliny's *Hȳpĕrīcum* (Lewis and Short); White and Riddle, *Hypĕrĭcon*. Lindley gives *ī*; Glaser, &c., *ĭ*. On the whole, *ī* has more authority, though *ĭ* has almost universal usage on its side.

HYP-OC-AL-YM′-MA. *See* Hȳpŏ (beneath, inferior).

HYS-TER-Ĭ-A′-CĔ-I. *See* Hȳstĕrŏs (later, lower).

IB-E′-RIS. The Greek *Ibēris* (ἴβηρις), of Dioscorides; one often hears it called "Eye-bĕr-is."

IM-PAT′-Ĭ-ENS. To be pronounced, if accuracy is attempted, with four syllables as here given, not "Im-pay-shuns," as we often hear it.

I-NOC-AR′-PUS. The first syllable is long, being derived from *īs, īnŏs* (ἴς, ἰνός), a fibre—to be distinguished in sound from the prefix of such words as *in-od-o′-ra*, coming from the Latin preposition *in*.

Ĭ-O-NAN′-THA. *Read* ĭ-on-an′-tha; and *for* Ĭ-O-NE′-MA *read* ĭ-on-e′-ma. *See* Ĭŏn (a violet).

I′-SAT-IS. The Greek *Īsătis* (ἴσατις), reproduced in Latin with same quantity, &c.; *Isātis* according to Lindley, Hooker, Alcock, &c. Leunis-Frank and Glaser give it correctly.

JAS-Ĭ-O′-NE. The *Iasĭone* (ἰασιώνη) of Pliny and Theophrastus. Leunis-Frank and Lindley (in Paxton) give it correctly; Hooker, Lindley (in Loudon), &c., *Jasĭone*.

JAS-MIN-OD-O′-RA. The Latin adjective *ŏdōrus*, which forms the termination of this word, is often mispronounced *ōdŏrus*, after the analogy of the English word "ōdorous."

KAL-OS-ANTH′-ĒS. *Kalos* here is another form of Călŏs (καλός), beautiful (which *see*).

LAG-O′-PUS. *See* Lăgōs (a hare).

LAS-Ĭ-AN′-DRA. *See* Lăsĭŏs (rough, hairy).

LAT-ER-IF-LO′-RA. Words formed from *lătus, lătĕris*, a side, are to be distinguished from those which come from *lātus*, broad, such as

LA-TIF-OL′-Ĭ-A, broad-leaved.

LE′-CYTH-IS. The first syllable long, as the name comes from the Greek *lēcȳthos* (λήκυθος), a flask. Wittstein, Glaser, Lindley, &c., give it wrongly, *Lecȳthis*.

LE′-JIC-A. This word ought to be italicised.

LE-MO′-NĬ-A. First two syllables are long, from *leimōn* (λειμών), a meadow; to be distinguished from *Lemoniana*.

LĔ-O-NO′-TIS. *See* Lĕōn, lĕŏntŏs (a lion), and Ous, ōtŏs (an ear).

Pronouncing Dictionary—*continued.*

LEP-ID-AG′-ATH-IS. *See* Lĕpĭs, lĕpĭdos (a scale), *and* Ăgăthŏs (good).

LI-LA′-CIS. This and the kindred words ought to have the "lilac" in italic, coming, as it does, from *Lilas*, the Persian name of the Indigo-plant.

LĬ′-LĬ-UM. The first syllable is long, as proved by Virgil's line: "*Līlia, verbenasque premens, vescumque papaver*"; but the analogy of the English "lily" leads many to mispronounce the Latin word. It is connected with Leirĭŏn or Līrĭŏn (λείριον), a Lily (which *see*).

LI-MET′-TA, LI-MO′-NĬ-A, and LI-MO′-NUM to be italicised, as they are derived from the Persian *lĭ′-mún*, a lemon.

LI-MO-NĬ-AS′-TRUM. *See* Leimōn or Līmōn (a meadow).

LOB-E′-SĬA. *Read* Lo-be-sĭ-a, from *lōbesis* (λώβησις), injury.

LO-MAG-RAM′-ME. *See* Lōmă, lōmătŏs (a border, fringe).

LOPH-ANTH′-US. *See* Lŏphŏs (a crest).

LO-RANTH′-US. *See* Lōrōn (a thong).

LOR-IN-SE-Ĭ′-A. The "Lorinser" to be italicised; the name is commemorative of Dr. Gustave Lorinser.

LYC-OP-OD′-Ĭ-UM. *See* Lȳcŏs (a wolf) *and* Pous or pūs, pŏdŏs (a foot). Lindley gives rightly *Lycopŏdium*; Hooker, McNicoll, &c., *Lycopōdium*.

MAC-ROC-NE′-MUM. *See* Măcrŏs (long), and Cnēmē (the leg).

MAL′-Ĕ-OL-ENS. The first syllable is short, from *mălus* (bad); the compounds of which are to be distinguished from those of *Mālus* (an Apple-tree), whence comes MA′-LI.

ME-CO-NOP′-SIS. *See* Mēcōn, mēcōnŏs (a poppy).

ME′-DIC-A. The first syllable long, from the Greek *Mēdicos* (Μηδικός), Median. To be distinguished from *mĕdĭcus* (curative), and from the commemorative MED-I′-CĬ-A.

MEG-AP-OT-AM′-IC-US. *See* Mĕgās, mĕgălŏs (big). The "Big River" commemorated is the Rio Grande.

MEL-AL-EU′-CA. *See* Mĕlās, mĕlănŏs (black).

MEL-AN-ORH′-OD-A. *See* Mĕlās, mĕlănŏs (black), *and* Rhŏdŏn (a rose).

MEL-IL-O′-TUS. *See* Mĕlĭ, mĕlĭtŏs (honey).

MĔ′-LO. *See* Mēlŏn (an apple).

MEL-OL-ONTH′-A. Read *Me-lol-onth′-a*; it is the Greek *Mēlŏlŏnthē* (μηλολόνθη) mentioned by Aristotle.

ME-NIS-PER′-MUM. From *mēn, mēnos* (μήν, μηνός), a month, the moon, "Moonseed."

MES-ĒM-BRĬ-ANTH′-EM-UM. From *mesēmbria* (μεσημβρία), mid-day. Linnæus gives as the derivation *mĕsŏs* (μέσος), middle, and ĕmbrȳŏn (ἔμβρυον), an embryo.

MI-CRAN′-DRA. *See* Mīcrŏs (little).

MI′-MUL-US. Latin *Mīmulus*, a diminutive of Greek *mīmŏs* (μῖμος), an actor. Pliny has *Mimmulus*, a doubtful plant-name. Rightly Lindley; *Mim′-ŭl-ŭs*, Hooker, &c.

MOL′-LĔ. To be distinguished from the preceding *Mol′-le*, a Peruvian name, and from the next word marked with an asterisk,

MO′-LY, the Greek *Mōly* (μῶλυ) mentioned by Homer.

MON-AC-ANTH′-A. *See* Mŏnŏs (alone, solitary). Some readers may think it unnecessary to point out that the first syllable is short; but those who have heard a late eminent Professor of Botany invariably speaking in his lectures of "Moan-O-Cotyledons" (as if he were calling upon the cotyledons to lament), will acknowledge that it is possible to make a mistake in the matter.

MON-OD′-OR-A. In accordance with the derivation from *Mŏnŏs* and *dŏra* (δορά), a skin. *Note* the difference from *in-od-o′-ra* and *jas-min-od-o′-ra*.

MŸ-OS-O′-TIS. *See* Mȳs, mȳŏs (a mouse).

MY-RĬ-AC-ANTH′-A. *See* Myrios.

MYR-OB-AL′-AN-US. *See* Mȳrŏn (sweet ointment) *and* Bălănŏs (an acorn).

NEC-TAN′-DRA. Words derived from *nĕctar* (νέκταρ) ought not to be confused with those which come from *nēctris* (νῆκτρις), a swimmer, such as *Nēctria, Nēctris*.

NE-MAC-O′-NĬ-A. *See* Nēmă, nēmătŏs (a thread).

NEM-OPH′-IL-A. From *nĕmŏs* (νέμος), a glade, and Phĭlŏs (fond), which *see*.

Pronouncing Dictionary—*continued.*

NEP'-ET-A. Pliny's name. Lindley gives *Nepēta*, which is the commoner pronunciation.

NEPH-RAN'-DRA. *See* Nĕphrŏs (a kidney).

NI'-BUNG. This word should be italicised.

NOT-EL-Æ'-A. *See* Nŏtŏs (*νότος*), the South, to be distinguished from the compounds of Nōtŏs (*νῶτος*), the back.

OAKES'-Ĭ-A. *See* discussion of *Stokes'*-ĭ-a, &c., p. 348.

O-CHRAN'-THE. The first syllable long, as the word is derived from ōchros (*ὠχρός*), pale.

OD-ON-TAD-E'-NĬ-A. *See* Ŏdous, ŏdŏntŏs (a tooth).

OD-O'-RA. *Compare* the note on jasminodora, above.

ŒN-OTH-E'-RA. Often pronounced *Œn-oth'-ĕr-a.* It is the Greek *Oinothēras* (*οἰνοθήρας*) of Theophrastus.

OL-IG-AN'-THA. *See* Ŏlĭgŏs (little).

OM-PHAL-AN'-DRĬ-A. *See* Ŏmphălŏs (the navel).

ON-CID'-Ĭ-UM. From *oncos* (*ὄγκος*), a tumour, and Eidŏs or īdŏs (appearance), which *see*. Words so derived ought strictly to have their termination pronounced *-īdium.* But there are many words in *-idium* which have not this derivation, such as *Aspĭdium* (from *aspis, aspĭdŏs*), *Glottĭdium* (from *glottis, glottĭdŏs*), *Lepĭdium* (from *lepis, lĕpĭdŏs*), *Xiphĭdium*, &c.

ON-OS'-ER-IS. *See* Ŏnŏs (an ass) *and* Sĕrĭs (Succory).

ON-YCH'-Ĭ-UM. *See* Ŏnyx, ŏnychŏs (a claw).

OPH-Ĭ-OG-LŌS'-SUM. *See* Ophis, ŏphĭŏs (a snake).

OP-OP'-ON-AX. The more correct spelling from an etymological point of view is *Opopanax.* *See* Pănax, pănăkŏs (all-heal, panacea).

OR-I'-GAN-UM. Often pronounced *Orĭg'-an-um*; but the Greek form is *Ŏreiganon* (*ὀρείγανον*), Mountain-pride.

OR-NI-THOG'-AL-UM. *See* Ornis, ornīthŏs (a bird).

OX-Ŭ-AC-AN'-THA. *See* Ŏxŭs (sharp, acid).

PACH-Ŭ-AN'-THA. *See* Păchŭs (thick).

PAR-AC-AR'-Ŭ-UM. *See* Cărўŏn (a nut, fruit-stone).

PED-I-LAN'-THUS. *See* Pĕdīlŏn (a shoe).

PER-Ĭ-AC-AN'-THUS. *See* Pĕrĭ (round).

PER-IP'-LOC-A. *See* Pĕrĭ (round) *and* Plŏcē (a twining).

PER-ON-OS'-POR-A. From *pĕrŏne* (*περόνη*), a buckle. *Compare* Belo-pĕrŏne, above.

PET-AL-AC'-TE. *See* Pĕtălŏn (a leaf, petal).

PHIL-AD-EL'-PHUS. *See* Philŏs (fond).

PHIL-AG-E'-RĬ-A. This word is partly of classical derivation and partly commemorative, as it is a compound of the names *Philesia* and *Lapageria*—one meaning affection, the other called after the Empress Josephine.

PHLEB-IG-O'-NĬ-UM. *See* Phlĕps, phlĕbŏs (a vein).

PHYL-LACH'-NE. *See* Phyllŏn (a leaf) *and* the note on Ac-iph-yl'-la.

PHY'-SAL-IS. *See* Phўsa (a bladder, bellows), which comes from the same root.

PHYT-EL'-EPH-AS. *See* Phўtŏn (a plant).

PI'-LĔ-A. *See* Pilŏs (a hat).

PIL-IF'-ER-UM. Words formed from the Latin *pĭlus*, a hair (*e.g., pĭliferum, Pĭlosella*, &c.), or from the Latin *pĭla*, a ball (*Pĭlularia, pĭlulifera*), are to be distinguished from those which come from the Greek *pīlos* (*πῖλος*), a hat (*Pīlo-carpus, Pīlo-phora*).

PIP'-ER. Commonly pronounced as if it were connected with bagpipes; but both the Greek form *Pĕpĕrĭ* (*πέπερι*) and the Latin *Pĭper* have the first syllable short. *Compare* Pep-er-id'-Ĭ-um *and* Pep-er-o'-mĭ-a.

PLAG-Ĭ-AN'-THUS. *See* Plăgĭŏs (oblique).

PLAT-YC-AN'-THA. *See* Plătўs (broad).

PLEC-TOC-EPH'-AL-US. *See* Plĕctŏs (twisted).

PLĔC-TRAN'-THUS. *See* Plĕctrŏn (a spur). The length of the first syllable distinguishes this word from the compounds of Plĕctŏs (twisted).

PLOC-OG-LŌT'-TIS. *See* Plŏcē (a twining).

PO-GOG'-YN-E. *See* Pōgōn, pōgōnŏs (a beard), *and* Gўne (a woman).

POL-Ŭ-AC-AN'-THA. *See* Pŏlŭs (much, many).

PO'-PUL-US. The first syllable is long, though generally pronounced short, as in *pŏpulus* (a people). Virgil has "*Pōpulus in fluviis, abies in montibus altis,*" and the old memorial line runs—"*Sunt cives urbis pŏpulus, sed pōpulus arbor.*"

POR-PHYR-AN'-THA. *See* Pŏrphўrĕŏs (purple).

PRAS-AN'-THE-A. *See* Prăsŏn (a leek).

PRI'-MUL-A. Generally pronounced "Prĭm-mula"; but the first syllable is long, from the Latin *prīmus* (first). Lindley and Hooker give it correctly.

PRUM-NOP'-IT-YS. *See* Pĭtўs, Pitўŏs (a Pine-tree).

PSI'-LA. *See* Psīlŏs (bare).

PSY'-CHE. *See* Psўchē (the soul, a butterfly).

PTER-OC-AR'-PUS. *See* Ptĕrŏn (a feather, leaf).

PTIL-OC-NE'-MA. *See* Ptĭlŏn (a feather).

PYR-AC-AN'-THA. *See* Pўr, pўrŏs (a fire).

PY-RE'-NA. This word is not a generic name, but a technical term. For generic names from the same root, *see* Pyrēn, pyrēnŏs (a kernel, fruit-stone).

PYR-ETH'-RUM. *See* Pўr, pўrŏs (a fire). Lindley, Hooker, &c., give *Pyrēthrum*; Glaser rightly, *Pyrĕthrum*, from Greek *Pўrĕthron* (*πύρεθρον*).

PYR'-US. The true Latin form is *Pĭrus.* Lindley gives it correctly; Hooker and Alcock wrongly, *Py'-rus.*

QUEL'-TĪ-A. *Quelt* should be italicised.

RACH-IRH-I'-ZON. *See* Răchĭs or rhăchĭs, rhăchĭŏs (the back).

RA-DI'-CANS. Generally pronounced like the English "radical"; but the first two syllables are long, from *rādix, rādīcis* (a root).

RAD'-Ĭ-OL-A. This word, a diminutive of *rădius*, has had much the same fate as *Glăd'-ĭŏlus*, a diminutive of *glădius.* It is often called *Radĭŏ'-la*, sometimes *Radī-ŏla*; and by very few correctly, *Rad'ĭŏla*, with all the syllables short. One book actually prints it "Ray-di-ō-lah," Hooker has *Radĭ'ola*; Alcock gives that and the correct form.

RA-NUN'-CUL-US. First syllable long, from *rāna* (a frog).

RAPH-ID-AC-AN'-THA. *See* Răphĭs or rhăphĭs, rhăphĭdŏs (a needle).

RHAPH-ID-OPH'-OR-A. In this word we have a more correct spelling of *Raphidophora.* *See* the remarks at the beginning of List of Root-words.

RHI-NAC-AN'-THUS. *See* Rhis, rhīnŏs (the nose.)

RHI-PID-OD-EN'-DRON. *See* Rīpis or rhīpĭs, rhīpĭdŏs (a fan).

RHI-ZOB'-Ĭ-US. *See* Rhīza (a root).

RHOD-OD-EN'-DRON. *See* Rhŏdŏn (a rose). The first syllable is short.

RHYT-ID-AN'-DRA. The first two syllables are short from *Rhўtis, rhўtĭdŏs* (*ῥυτίς, ῥυτίδος*), a wrinkle.

ROS'-A. Although the English word "Rose" and the girl's name "Rosa" are pronounced with the *o* long, the Latin *Rŏsa* has it short. It is connected with *Rhŏdon*, just as *Lĭlĭum* is connected with *Lirion.* Lindley (in Paxton, 1840) gives it correctly; Lindley (in Loudon, 1829), Hooker, Alcock, and the rest, wrongly, *Rō-sa.*

RUB'-ER, and its derivative (*See* Vaniček, p. 14),

RUB'-US, have the first syllable short: "*Mella fluant illi, ferat et rŭbus asper amomum*"—Virgil. The textbooks are divided, as in the case of *Rosa.*

SAX-IF'-RAG-A. "The Stone-breaker." *Compare* os-sif'-rag-um (bone-breaking). All authorities of any worth, either in English or German, give this word correctly *Sax-if'-răg-a*; but a book which seems to aim at being a handy little compendium of every vulgar error in pronunciation (and, indeed, has a certain amount of usefulness in that way), prints it "Sax-i-frā-gah." This sound is, unfortunately, often heard.

SCAPH'-A. *See* Scăphē (a boat, skiff).

SCHŒN-OP'-RAS-UM. *See* Prăsŏn (a leek). Alcock gives it wrongly *-pra'-sum*, and the "authority" mentioned under Saxifraga boldly writes "Skee-nō-pray-sum"! All others correctly.

SCĬ-AD-OC'-AL-YX. *See* Scĭăs, scĭădŏs (a shade, an umbrella).

Pronouncing Dictionary—*continued.*

SCLA′-RĔ-A. This word is a late Latin one, occurring in the work of Walafrid Strabo, and should therefore not be italicised.

SCLE-RAN′-THUS. The first syllable long, from the Greek *sclērŏs* (*σκληρός*) hard.

SEC-A′-LE. The Latin *Sĕcāle*: it is sometimes wrongly pronounced *Sec′-ăl-e*, and sometimes in two syllables exactly like the English sea-kale.

SED′-UM. The first syllable is almost always sounded with a long *e*, and is so given in many books; but the Latin word used by Pliny is *Sĕdum*.

SE-MĬ-A-LA′-TA. The Latin *sēmĭ*, half, like the corresponding Greek *Hēmĭ* (which *see* among the Root-words), has the first syllable long.

SEN-EC′-Ĭ-O. This is an old Latin word used by Pliny, and has the second syllable short.

SE-TA′-CĔ-A. This and several words beginning with the same letters come from the Latin *sēta* (a bristle). *Compare* brevisēta.

SID-E-RI′-TIS. *See* Sĭdērŏs (iron).

SIPH′-O. *See* Sĭphōn, sĭphōnŏs (a reed, tube).

SIPH-OC-AM′-PYL-OS. *See* Sĭphōn, sĭphōnŏs (a reed, tube) *and* Campўlŏs (curved).

SI-TOC-O′-DĬ-UM. *See* Sītŏs (Wheat).

SO-LE′-NA. *See* Sōlēn (a pipe).

SOPH′-Ĭ-A. *See* p. 347. This is the Greek *sŏphĭa* (*σοφία*), wisdom. Lindley and Hooker give *Sophi′-a* wrongly; but Alcock corrects the form into *Soph′-ia* in his "Additions and Corrections."

SO-ROC-EPH′-AL-US. *See* Sōrŏs (a heap).

SPATH-A′-CĔ-A. *See* Spăthē (a blade, flower-sheath).

SPER-MAC-O′-CE. From *acōcē* (*ἀκώκη*). *Compare* Ac-o′-kan-the′-ra, p. 277.

SPHÆR-ŎTH-E′-LE. *See* Thēlē (a teat).

SPHE-NAN′-DRA. *See* Sphēn, sphēnŏs (a wedge).

SPI-LAN′-THĒS. *See* Spīlŏs (a spot).

SPI-RÆ′-A. *See* Spīra or speira (a coil).

SPOR-AD-OC-AR′-PUM. From the Greek *spŏrăs*, *spŏrădŏs* (*σποράς*, *σποράδος*), scattered. *See* Spŏră (a seed).

STACH-Ў-OP-O′-GŌN. *See* Stăchўs, stăchўŏs (an ear of corn).

STAN′-LEY-A. Lindley thus gives the pronunciation of this name, in accordance with that of the surname from which it comes; but Wittstein and others, erroneously, *Stan-ley′-a*. *See* p. 348.

STAPH-YL-E′-A. *See* Stăphўlē (a cluster of grapes).

STE-MO′-DĬ-A. *See* Stēmōn (the warp, a stamen).

STEN-OC-AR′-PUS. *See* Stĕnŏs (narrow).

STEPH-AN-AN′-DRA. *See* Stĕphŏs and Stĕphănē (a crown).

STI-PIT-A′-TUM. *See* note on albo-stipes.

STOKES′-Ĭ-A. Even Lindley gives this Stokēsĭa. For a full discussion of the word, see p. 348.

STROB′-IL-A. *See* Strŏbĭlŏs (a fir-cone).

STY-LAN′-DRA. *See* Stўlŏs (a pillar, style). The termination *-stylis*, has been given as short all through the Pronouncing Dictionary, since the authors of the names in which it occurs held the old belief that the Latin *stўlus* was the representative of the Greek *stўlos* (*στῦλος*). This etymology has now been proved quite groundless, as *stylus* is a mistake for *stĭlus*, coming from the root *stig* (*compare* Vaniček, Lewis and Short, &c., *sub voc.*): in strict accuracy, therefore, the termination ought to be *-stўlis*.

SU′-BER, cork, has the first syllable long, the second short; from it comes

SU-BER-O′-SA, corky, which is pronounced similarly, and which differs completely from

SUB-E-RO′-SA, slightly indented; this has the first syllable short, the second long. *See* Martyn, *sub voc.*

SY-KES′-Ĭ-A. *Delete* the first hyphen. *See also* discussion of the word on p. 348.

SYN-AR′-RHEN-A. *See* Arrhēn, arrhĕnŏs or arrĕnŏs (a male).

SY-RING′-A. *See* Sўrinx, sўringŏs (a pipe).

THEC′-A. This generic name comes from the Malabar

Pronouncing Dictionary—*continued.*

thĕka or *tekka*, which is also seen in *Tec′-ton-a*; it is to be carefully distinguished from the Latin *theca*, Greek *Thēcē* (*θήκη*), which *see*.

THE′-LA. *See* Thēlē (a teat).

THE-LYG-ON′-Ĕ-Æ. *See* Thēlўs (female).

THE′-SĬ-UM. Better *The-sĭ′-um*. It is the *Thēseiŏn* (*θήσειον*) of Theophrastus, Pliny's *Thēsīon* (Lewis and Short). White and Riddle give *Thēsĭum*, Withering, Lindley, and others, *Thēsĭum*.

THU-RIF-RA′-GA. This word, meaning odoriferous, is not connected with the *-frăga* in *Saxifrăga*.

THYM′-US. The Greek *Thўmos* (*θύμος*), Thyme, has the first syllable short, and is thereby distinguished from *thўmos* (*θυμός*), the soul. Although the quantity appears plainly in a well-known line of the Æneid: "*Fervet opus, redolentque thўmo fragrantia mella*," Lindley and his followers all mistake the pronunciation of the word.

TRA-CHYC-AR′-PUS. *See* Trāchўs (rough).

TRAG′-Ĭ-A. *See* Trăgŏs (a he-goat). The name is really commemorative of Jerome Bock. *See* p. 348.

TRICH-AN′-THA. *See* Thrix, trĭchŏs (hair).

TRĬ′-TIC-UM. The first syllable long (*compare* Alcock, "Additions and Corrections"), to be distinguished from *Trit′-om-a*.

TRIT′-OM-A, the Greek *trĭtŏmos* (*τρίτομος*), thrice-cut. *See* Tōmē (a cut). Lindley, followed by McNicoll, gives *Tritōma*; Wittstein and Glaser rightly *Trităma*.

TROP-Æ′-OL-UM. A vulgar rendering is *Trop-œ-o′-lum*.

TROP-ID′-Ĭ-A. *See* Trŏpĭs, trŏpĭdŏs (a keel).

TUB-A′-TA. The *u* in *tūba* (a trumpet) is short, and the words which contain *tūba* should be pronounced differently from those formed from

TU′-BER, which has the first syllable long.

TYL-OCH-Ĭ′-LUS. *See* Tўlŏs (a knot).

UM-BIL-I′-CUS. Often pronounced as if it were "Umbilly-cus."

U′-NED-O. Few words could present less difficulty as to pronunciation. It comes from *ūnus* (one) and *ĕdo* (I eat) —since no one had the courage to eat a second—and the word *Ūnĕdo* itself is found in Pliny. Withering, who took much pains about pronunciation, gives it correctly; but Lindley, followed as usual by Alcock, Hooker, &c., have *Unēdo*, and they have succeeded in making people say, "You-need-oh."

U-ROC-YS′-TIS. *See* Oura (a tail).

UR-TI′-CA. Often wrongly pronounced *Ur′-tĭc-a*. It is so given by Lindley (in Paxton), and by Alcock, who afterwards corrected it.

VAC-CI′-NĬ-UM. The second syllable is long, as in Virgil's "*Alba ligustra cadunt, vaccīnia nigra leguntur*."

VAG′-ANS. The first syllable is short, while the similar combination of letters in *vaginalis*, &c., is long.

VER-ON-I′-CA. This mediæval word is probably a Latin form of the Greek *Bĕrŏnīkē* (*Βερονίκη*). (*See* Karl Pearson's "Die Fronica.") Many other derivations have been ascribed, such as the Arabic *viroo nikoo* (beautiful remembrance)! Withering says quaintly, "In *Veroni′ca* the *Ni* is to be the accented syllable, and not the *Ro*, which is a common error." Alcock, who adopts the derivation, *hiera eicon* (*ἱερά εἰκών*), sacred image, follows him in this; Lindley, Hooker, &c., persist in the "common error."

VE-SI-CA′-RĬ-A. The first two syllables in this and the five following words on p. 343 are long. They are very frequently pronounced as if short.

WAG′-NER-I. *Delete* the long mark over *a* in this and three following words on p. 344. The *w* in words derived from German proper names is generally sounded as our *v*.

XE-RAN′-DRA. *See* Xērŏs (dry).

XIPH-ID′-Ĭ-UM. *See* Xĭphŏs (a sword).

XYL-AC-AN′-THA. *See* Xўlŏn (wood).

ZA′-MĬ-A. *See* Zēmĭa (loss).

ZO-STE′-RA. *See* Zōstēr (a belt).

ZYG-AD-E′-NUS. *See* Zўgŏn (a yoke).

Pronouncing Dictionary—*continued.*

LIST OF GREEK ROOT-WORDS,

From which a large number of Botanical Names are derived.

The words given in the original Greek characters are often very helpful in showing what is the correct pronunciation, as the Greek alphabet has different letters for long and short vowels: ε = ĕ, as *ἀνθεμίς* = anthĕmis; η = ē, as *ἀνθηρά* = anthēra; ο = ŏ, as *βρόμος* = brŏmos; ω = ō, as *βρῶμα* = brōma. When Greek words are written in Latin characters, *ει* is often represented by *ī*, as *χεῖλος* = cheilos or chīlos; *ου* by *ū*, as *οὐρά* = oura or ūra; *αι* by æ, as *χαμαί* chamæ. The Greek *υ* is generally represented by the Latin *y*, and the terminations *-ος* and *-ον* are frequently written in Latin as *-us* and *-um*; *e.g.*, *βρύον*, moss, appears in botanical nomenclature as *Bryum*, as well as *Bryon*. Of the consonants, the Greek *κ* becomes in Latin *c*, *χ* is represented by *ch*, and *γγ* by *ng*: *καλός* = calos, *χρυσός* = chrysos, *ἀγγεῖον* = angion. The aspirate, or rough breathing ['] ought to be represented by *h*; but this is sometimes incorrectly omitted in botanical names: for instance, from *ἄῤῥην* (arrhēn) we find *arrenum* as well as *arrhenu*; and *ῥαφις* (rhaphis) produces *Raphidophora* as well as the more correct *Rhaphidophora*. In this list, words in which the root appears as a prefix are divided by a colon from words in which it appears as a postfix; the semicolons separate the different forms of the prefixes or postfixes. The words themselves are divided internally by hyphens in accordance with their etymology, not as in the body of the Pronouncing Dictionary.

ROOT-WORD.	EXAMPLES OF DERIVATIVES.
Ăchȳrŏn (*ἄχυρον*), chaff	Ăchȳr-anthes, Ăchȳr-acantha; Ăchȳrŏ-nia, Ăchȳrŏ-pappus.
Ăcĭs, ăcĭdŏs (*ἀκίς, ἀκίδος*), a point	Ăcĭ-notus, Ăcĭ-phylla; Ăcĭd-andra; Ăcĭsanthera.
Actĭs, actīnŏs (*ἀκτίς, ακτῖνος*), a ray	Actīno-carpus, Actīno-lepis, Actīno-meris, Actīno-nema.
Ădēn, adĕnŏs (*ἀδήν, ἀδένος*), a gland	Ădĕn-andra, Ădĕn-anthera; Ădĕno-carpus, Ădĕno-phora: Dipl-ădĕnia, Gymn-ădĕnia; Myri-ădĕnus, Tachi-ădĕnus.
Ăgăthŏs (*ἀγαθός*), good	Ăgăth-a, Ăgăth-is; Ăgăthŏ-meris, Ăgăthŏ-phyllum: Lepid-ăgăthis, Phyll-ăgăthis.
Ampĕlŏs (*ἄμπελος*), a vine	Ampĕl-opsis; ampĕlŏ-phagum, Ampĕlŏ-sicyos: Ciss-ampĕlŏs.
Angeiŏn or Angĭŏn (*ἀγγεῖον*), a vessel	Angī-anthus; Angĭŏ-pteris: Anœct-angium.
Anthĕmŏn (*ἄνθεμον*), a flower	Chrys-anthĕmum, Heli-anthĕmum, Leuc-anthĕmum, Mesembry-anthĕmum.
Anthēra (*ἀνθῆρα*), an anther	Acis-anthēra, Cephal-anthēra, Cyrt-anthēra, Plat-anthēra.
Argȳrŏs (*ἄργυρος*), silver	Argȳr-eia, Argȳrŏ-chæta, Argȳrŏ-phyton, argȳrŏ-stigma.
Arrhēn, arrhĕnŏs or arrĕnŏs (*ἄῤῥην, ἄῤῥενος*) a male	Gloss-arrhēn; Odont-arrhēna, Syn-arrhĕna; Dis-arrĕnum.
Bălănŏs (*βάλανος*), an acorn	Bălăn-ites; Bălănŏ-pteris: Chryso-bălănŭs, Myro-bălănŭs.
Bărȳs (*βαρύς*), heavy	Bărȳ-andra, Bărȳ-osma, bărȳ-stachys, Bărȳ-xylon.
Bĕlŏs (*βέλος*), a dart	Bĕlŏ-perone, bĕlŏ-phorus, bĕlŏ-phyllum.
Bĭŏs (*βίος*), life	Bĭŏ-phytum, Bĭŏ-rhiza: Ammo-bĭum, Dendro-bĭum, Petro-bĭum.
Blĕphărĭs (*βλεφαρίς*), an eyelash	Blĕphărĭs, blĕphărĭ-glottis: Calli-blĕphărĭs, Carpi-[blĕphărĭs.
Blĕphărŏn (*βλέφαρον*), an eyelid	blĕphărŏ-phylla: Octo-blĕphărŏn.
Bŏtrȳs, bŏtrȳŏs (*βότρυς, βότρυος*), a cluster	Bŏtrȳs; Bŏtrȳ-anthus; Bŏtrȳŏ-dendron: Poly-bŏtrya; Adelo-bŏtrȳs, Leuco-bŏtrȳs, macro-bŏtrȳs.
Brăchȳs (*βραχύς*), short	Brăchȳ-chiton, Brăchȳ-come, Brăchȳ-loma, Brăchȳ-rhynchos, Brăchȳ-sema.
Brōma (*βρῶμα*), food	Bu-brōma (Bulls' Food), Ono-brōma (Asses' Food), Theo-brōma (the Gods' Food), Hippo-brōmus (Horses' Food).
Būs (*βοῦς*), an ox, a bull	Bū-ceras (Bull's Horn), Bū-cephalon (Bull's Head), Bū-glossum (Bull's Tongue, "Oxtongue").

Pronouncing Dictionary—*continued.*

Root-word.	Examples of Derivatives.
Călŏs (*καλός*), beautiful	Căl-anthe; Căl-ea, Călŏ-chilus, Călŏ-dendron, Călŏ-pogon.
Călyptra (*καλύπτρα*), a veil	Călyptr-anthes, Călyptr-ion; Călyptro-calyx, Călyptro-gyne, Călyptro-noma.
Călyx, călycŏs (*κάλυξ, κάλυκος*), a covering, calyx	Călyc-anthus, Călyc-ium; Călycŏ-stemma, Călycŏ-tome: Physo-călycium Calyptro-călyx, Macro-călyx.
Cămpylŏs (*καμπύλος*), curved	Cămpyl-anthera; Cămpylŏ-botrys, Cămpylŏ-centron, Cămpylŏ-neuron: Sipho-cămpylŏs.
Cărўŏn (*κάρυον*), a nut, fruit-stone	Cărў-a; Cărўŏ-phyllus, Cărўŏ-pteris, Cărўŏ-taxus: Lepido-cărўa, Ptero-cărўa; Astro-cărўum, Para-cărўum.
Cephălē (*κεφαλή*), a head	Cephăl-anthera, Cephăl-otus: a-cephălā; Bu-cephălon; Dasy-cephălum; Dracocephalum; Cerato-cephălus.
Cĕrăs, cĕrătŏs (*κέρας, κέρατος*), a horn	Cĕrăs-tium; Cĕrătŏ-cephalus, Cĕrătŏ-chilus, Cĕrătŏ-dactylis: Brachy-cĕrăs, Bu-cĕrăs, Lepto-cĕrăs.
Chămæ (*χαμαι*), on the ground, dwarf	Chămæ-batia, Chămæ-buxus, Chămæ-cerasus, Chămæ-cistus.
Chărĭs, chărĭtŏs (*χάρις, χάριτος*), grace, beauty	Chărĭ-anthus, Chărĭ-eis: Ammo-chărĭs, Eu-chărĭs, Hydro-chărĭs, Limno-chărĭs, Oreo-chărĭs.
Cheilŏs *or* chīlŏs (*χεῖλος*), a lip	Cheil-anthes; Cheilŏs-andra; Chīlŏ-gnatha: Anœcto-chīlus, Crypto-chīlus; chloro-chīlum, macro-chīlum.
Cheima *or* chīma, chīmătŏs (*χεῖμα, χείματος*) cold, winter	Chīmă-phila; Cheīmătŏ-bia; Chīmon-anthus (from chīmōn, chīmōnos = winter).
Cheir *or* chīr, chīrŏs (*χείρ, χειρός*), a hand	Cheir-anthus; Cheirŏ-glossa, Cheirŏ-stemon; Chīrŏ-myces.
Chĭŏn, chĭŏnŏs (*χιών, χιόνος*), snow	Chĭŏn-anthus, Chĭŏn-aspis; Chĭŏnŏ-doxa, Chĭŏnŏ-graphis.
Chĭtōn, chĭtōnŏs (*χιτών, χιτῶνος*), a tunic	Chĭtōn-ia: Diplo-chĭta; Brachy-chĭtōn, Rhodo-chĭtōn.
Chlămўs, chlămўdŏs (*χλαμύς, χλαμύδος*), a cloak	Chlămўd-ia; Chlămўdŏ-stylis; Chlămў-sporum: Allo-chlămўs, Diplo-chlămўs.
Chlŏă (*χλοά*), grass	Chlŏ-anthes, Chlŏ-opsis: Echino-chlŏă; Hiero-chlŏē.
Chlōrŏs (*χλωρός*), green	Chlōr-a, Chlōr-antha; Chlōrŏ-galum, Chlōrŏ-phytum.
Chrŏă (*χρόα*), colour	Calli-chrŏa, Di-chrŏa, Eu-chrŏa, Salpi-chrŏa.
Chrōmă, chrōmătŏs (*χρῶμα, χρώματος*), colour	chrōmăt-ella: Di-chrōma, Eu-chrōma, penta-chrōmum.
Chrўsŏs (*χρυσός*), gold	Chrўs-anthemum, Chrўs-urus; Chrўsŏ-balanus, Chrўsŏ-gonum: Eli-chrўsum, Heli-chrўsum, holo-chrўsum.
Clădŏs (*κλάδος*), a branch	Clăd-ius; Clădŏ-bium, Clădŏ-sporium: acro-clădŏn, ptero-clădŏn; Macro-clădus, Phyllo-clădus; Como-clădia; tricho-clăda.
Clīnē (*κλίνη*), a couch	Clīnŏ-podium, Clīnŏ-stylis: Eury-clīnē; Acro-clīnĭum, Coma-clīnĭum, Mega-clīnĭum; Platy-clīnis.
Cnēmē (*κνήμη*), the leg	Erio-cnēma, Ptilo-cnēma; Macro-cnēmum, Poly-cnēmum.
Cōdōn, cōdōnŏs (*κώδων, κωδώνος*), a bell	Cōdōn-ium; Cōdōnŏ-phora: Phæno-cōdōn, Platy-cōdōn.
Cŏmē (*κόμη*), hair	Cŏma-clinium; Cŏme-sperma: acantho-cŏma, Calli-cŏma, Chryso-cŏma; Amphi-cŏme, Brachy-cŏme.
Cōnŏs (*κῶνος*), a cone	Cōn-andron, Cōnŏ-carpus, Cōnŏ-clinium, Cōnŏ-spermum.
Cŏrўs, cŏrўthŏs (*κόρυς, κόρυθος*), a helmet	Cŏrў-anthes; Cŏrўs-anthera, Cŏrўth-acanthus.
Cŏrўnē (*κορύνη*), a club	Cŏrўnē-um; Cŏrўnŏ-carpus; Crypto-cŏrўne.
Ctŏnŏs (*κτονος*), a murder	Cyno-ctŏnum (dog-slaying), lyco-ctŏnum (wolf-slaying), melo-ctŏnum (badger-slaying).
Cўănŏs (*κύανος*), dark blue	Cўăn-anthus, Cўăn-ella, Cўăn-otis, Cўăn-us; cўănŏ-carpus, Cўănŏ-phyllum.
Cўăthŏs (*κύαθος*), a cup	Cўăth-ea, Cўăth-odes; Cўăthŏ-coma, Cўăthŏ-phora.
Cўōn, cўnŏs (*κύων, κύνος*), a dog	cўn-anchica, Cўn-anchum, Cўn-odon; Cўnŏ-crambe, Cўnŏ-ctonum: Apo-cўnum.
Cўphŏs (*κυφός*), bent, round	Cўph-ia, Cўph-iella; Cўphŏ-kentia, Cўphŏ-sperma.
Dăctўlŏs (*δάκτυλος*), a finger	Dăctўlĭ-capnos; Dăctўlŏ-ctenium: Cerato-dactўlis, Penta-dăctўlĭs; Poly-dăctўla; Lepto-dăctўlŏn.
Dăsўs (*δασύς*), thick, hairy	dăsў-antha, Dăsў-chira, Dăsў-lirion, dăsў-phylla.
Dĕcă (*δέκα*), ten	dĕc-andra; Dĕcă-belone, Dĕcă-spermum, Dĕcă-spora.
Dĕrma, dĕrmătŏs (*δέρμα, δερματος*), skin	Dĕrmătŏ-phora, Dĕrmătŏ-carpon: Peri-dĕrmĭum; Lepto-dĕrmis; Caly-dĕrmos.
Dĭchă (*δίχα*), in two, asunder	Dĭch-æa, Dĭch-opsis; Dĭchŏ-sēma, dĭchŏ-toma.
Dictўŏn (*δίκτυον*), a net	Dictў-anthus; Dictўŏ-gramme, Dictўŏ-pteris, Dictўŏ-sperma: Calo-dictўŏn; Hemi-dictўum.
Dĭdўmŏs (*δίδυμος*), twin	Dĭdўmŏ-carpus, Dĭdўmŏ-chlæna, Dĭdўmŏ-sperma.
Dŏlĭchŏs (*δολιχός*), long	Dŏlĭchŏs, Dŏlĭchŏ-gyne, dŏlĭchŏ-centra, dŏlĭchŏ-rhiza.
Dōrŏn (*δῶρον*), a gift	Dōr-ema: Geo-dōrum, Hæmo-dōrum, Limo-dōrum.
Dŏrў, dŏrătŏs (*δόρυ, δόρατος*), a spear	Dŏrў-anthes; Dŏrўŏ-pteris; Dŏrāt-anthera; Dŏrătŏ-lepis.

Pronouncing Dictionary—*continued.*

Root-word.	Examples of Derivatives.
Drăcōn, drăcŏntŏs (*δράκων, δράκοντος*), a dragon	Drăc-æna; Drăcō-cephalum; Drăcŏnt-ium: Calo-drăcōn; Pseudo-drăcŏntium.
Drўs, drўŏs (*δρῦς, δρυός*), an oak	Drўŏ-balanops, Drўŏ-pteris, Drўŏ-stachyum: Chamæ-drys, Chamæ-drўŏn.
Ĕchĭs, ĕchĭŏs (*ἔχις, ἔχιος*), a viper, an adder	Ĕchĭ-um, Ĕchĭ-opsis; Ĕchĭŏ-glossum, Ĕchĭŏ-ides.
Ĕchīnŏs (*ἐχῖνος*), a hedgehog	Ĕchīn-anthus; Ĕchīnŏ-cactus, Ĕchīnŏ-spermum.
Eidŏs *or* īdŏs (*εἶδος*), appearance	asphodelo-īdēs, asparago-īdēs, asaro-īdēs, dactylo-īdēs, Echio-īdēs; Ion-īdium, Ionops-īdium.
Ĕrēmŏs (*ἐρῆμος*), desert, solitary	Ĕrēm-ia, Ĕrēm-urus; ĕrēmĭ-cola; Ĕrēmŏ-phila, Ĕrēmŏ-stachys.
Ĕrĭŏn (*ἔριον*), wool	Ĕrĭ-a, Ĕrĭ-opsis; Ĕrĭŏ-botrya, Ĕrĭŏ-chilus, Ĕrĭŏ-pappus.
Ĕrўthrŏs (*ἐρυθρός*), red	Ĕrўth-ea; Ĕrўthr-ina, ĕrўthrŏ-rachis; Ĕrўthrŏ-xylon.
Gălă, gălăctŏs (*γάλα, γάλακτος*), milk	Găl-anthus; Găl-act-ia, Găl-act-ites; Găl-acto-dendron: Poly-găla, Ornitho-găl-um.
Gălĕē (*γαλέη*), a weasel	Gălĕ-opsis; Gălĕŏ-bdolon, Gălĕŏ-glossum.
Geitōn or gētōn, (*γείτων*) a neighbour	Ammo-gētōn, Apono-gētōn, Potamo-gētōn.
Glōssa (*γλῶσσα*), a tongue	Glōss-anthus; Glōssŏ-comia, glōssŏ-mystax: Cheiro-glōssa Rhyti-glōssa; Bu-glōssum, Ophio-glōssum.
Glōttĭs, glōttĭdŏs (*γλωττίς, γλωττίδος*), a mouthpiece	Glōttid-ium: Blephari-glōttis, Dasy-glōttis, Hexa-glōttis, Lepto-glōttis, Sarco-glōttis, Tricho-glōttis.
Glўcўs (*γλυκύς*), sweet	Glўc-ine, Glўc-osmis; glўcў-phyllos, Glўcўr-rhiza.
Gōnĭa (*γωνία*), an angle	Gōnĭŏ-phlebium, Gōnĭŏ-pteris; Gōnŏ-calyx, Gōnŏ-stemon: Tri-gōnĭa, Tetra-gōnĭa; Aniso-gōnĭum, Oxy-gōnĭum.
Gŏnŏs (*γόνος*), offspring	Chryso-gŏnum, Poly-gŏnum (?), Thely-gŏnum.
Gŏnў, gŏnătŏs (*γόνυ, γόνατος*), the knee	Gŏnў-anthes; Gŏnăt-anthus, gŏnăt-odes; Gŏnătŏ-pus.
Gўnē, gўnaikŏs (*γυνή, γυναικός*), a woman	Gўn-andropsis; Gўnŏ-cephala: Ancyclo-gўnē, Calo-gўnē, Pleuro-gўnē; Cerato-gўnum; andro-gўnus.
Gўrŏs (*γυρός*), curved, round	Gўr-andra; gўrŏ-bulbon, Gўrŏ-stachys, Gўrŏ-theca.
Hēbē (*ἥβη*), youth	Hēbē-andra, hēbē-carpum, Hēbē-cladus, Hēbē-clinium.
Hēdўs (*ἡδυς*), sweet	Hēdўa, Hēdў-andra, Hēdў-osmum, Hēdў-scepe.
Hēlĭŏs (*ἥλιος*), the sun	Hēlĭ-anthus, Hēlĭ-opsis; Hēlĭŏ-carpus, Hēlĭŏ-tropium.
Hēmĕră (*ἡμέρα*), the day	Hēmĕrŏ-bius, hēmĕrŏ-biella, Hēmĕrŏ-callis.
Hēmĭ (*ἡμι*), half	Hēmĭ-andra, Hēmĭ-dictyum, Hēmĭ-meris, Hēmĭ-onitas.
Hĕspĕrŏs (*ἕσπερος*), evening	Hĕspĕr-antha, Hĕspĕr-is, Hĕspĕr-idium; Hĕspĕrŏ-scordon.
Hĕtĕrŏs (*ἕτερος*), another, different	hĕtĕr-acantha, Hĕtĕr-actis, Hĕtĕr-anthera; Hĕtĕrŏ-phlebium, Hĕtĕrŏ-ptera, Hĕtĕrŏ-theca.
Hŏlŏs (*ὅλος*), whole, perfect	hŏlŏ-chrysum, Hŏlŏ-discus, Hŏlŏ-gymne, Hŏlŏ-schœnus.
Hŏmălŏs (*ὁμαλός*), even, smooth	Hŏmăl-anthus, Hŏmăl-ium; Hŏmălŏ-nema.
Hўdōr, hўdătŏs (*ὕδωρ, ὕδατος*), water; in compounds, hўdrŏ (*ὑδρο*)	Hўdr-angea; Hўdrŏ-charis, Hўdrŏ-phyllum.
Hўmēn, hўmĕnŏs (*ὑμήν, ὑμένος*), marriage; y short in Latin	Hўmĕn-andra, Hўmĕn-anthera; Hўmĕnŏ-callis, Hўmĕnŏ-dictyon, Hўmĕnŏ-phyllum: Calyx-hўmĕnia.
Hўpĕr (*ὑπέρ*), above, superior	Hўpĕr-anthera, Hўpĕr-teles.
Hypo (*ὑπό*), beneath, inferior	Hўp-ericum; Hўpŏ-calymma, Hўpŏ-glauca, Hўpŏ-lepis.
Hўs, hўŏs (*ὗς, ὑός*), a pig	Hўŏ-phorbe, Hўŏ-spathe; Hўŏs-cyamus.
Hўstĕrŏs (*ὕστερος*), later, lower; hystera (*ὑστέρα*), matrix	Hўstĕr-ia, Hўstĕr-ium; Hўstĕrŏ-carpus, Hўstĕrŏ-nica.
Ĭŏn (*ἴον*), a violet	ĭŏn-antha, Ĭon-opsis; ĭŏnŏ-charis, ĭŏnŏ-ptera: Leuco-ĭum.
Lăgōs (*λαγώς*), a hare	Lăgō-pus (Hare's Foot); lăg-otis (Hare's Ear).
Lăsĭŏs (*λάσιος*), rough, hairy	Lăsĭ-andra; Lăsĭŏ-nema, Lăsĭŏ-petalum, Lăsĭŏ-pus.
Lĕcănē (*λεκανη*), a dish	Lĕcăn-ium, Lĕcăn-ora, Lĕcăn-otis; Lĕcănŏ-pteris.
Lēcўthŏs (*λήκυθος*), an oil-flask	Lēcўth-ea, Lēcўth-is, Lēcўth-ideæ, Lēcўth-opsis.
Leimōn *or* līmōn, līmōnŏs (*λειμών, λειμῶνος*), a meadow	Līmōn-ium; Līmōni-astrum; līmōnii-folium: Acantho-līmōn.
Leirĭŏn *or* līrĭŏn (*λείριον*), a lily	Līrĭ-anthe; Līrĭŏ-dendron: Pyro-līrĭon; Chamæ-līrĭum.
Lĕōn, lĕōntŏs (*λέων, λέοντος*), a lion	Lĕōn-otis, Lĕōn-urus; Lĕōnt-odon; Lĕōntŏ-podium, lĕōntŏ-glossa: Chamæ-lĕon.
Lĕpĭs, lĕpĭdŏs (*λεπίς, λεπίδος*), a scale	Lĕpĭd-agathis, Lĕpĭd-ium; Lĕpĭdŏ-caulon, lĕpĭdŏ-phylla: Actino-lĕpĭs, Iso-lĕpĭs, Lopho-lĕpĭs, Platy-lĕpĭs.

Pronouncing Dictionary—*continued.*

Root-word.	Examples of Derivatives.
Lŏbŏs (λοβός), a lobe	Lŏbŏ-stemon: acuti-lŏba, Cocco-lŏba; Aniso-lŏbŭs; Amphi-lŏbĭum, Astro-lŏbĭum, Epi-lŏbĭum.
Lōmă, lōmătŏs (λῶμα, λώματος), a border, fringe	Lōmă-gramme; Lōm-andra; Lōmătŏ-gonium, Lōmătŏ-phyllum: Antho-lōma, Micro-lōma, Platy-lōma.
Lŏphŏs (λόφος), a crest	Lŏph-anthus, Lŏph-idium; Lŏphŏ-lepis, Lŏphŏ-sorus: Alectoro-lŏphŭs, Platy-lŏphŭs; Amphi-lŏphĭum.
Lōrŏn (λῶρον), a thong	Lōr-anthus; Lōrŏ-glossum, Lōrŏ-petalum.
Lўcŏs (λύκος), a wolf	lўcŏ-ctonum, Lўcŏ-perdon, Lўcŏ-persicum, Lўcŏ-podium.
Măcrŏs (μακρός), long	măcr-acantha, Măcr-anthus; Măcrŏ-cladus, Măcrŏ-cnemum, Măcrŏ-glossa, Măcrŏ-rhynchus, Măcrŏ-stigma.
Mēcōn, mēcōnŏs (μήκων, μήκωνος), a poppy	Mēcōn-opsis, Mēcōn-idium: Dendro-mēcōn, Eo-mēcōn.
Mĕgăs, mĕgălŏn (μέγας, μεγάλον), big	Mĕgă-carpha, Mĕgă-chile; mĕgăl-antha; Mĕgălŏ-theca.
Mĕlăs, mĕlănŏs (μέλας, μέλανος), black	Mĕlă-leuca, Mĕlă-stoma; Mĕlăm-pyrum, Mĕlăm-psora; mĕlăn-ops; Mĕlănŏ-pteris: Chryso-mĕlăs.
Mĕlĭ, mĕlĭtŏs (μέλι, μελίτος), honey	Mĕlĭ-anthus, Mĕlĭ-cocca, Mĕlĭ-cope, Mĕlĭ-lotus.
Mēlŏn (μῆλον), an apple	Mēlŏ, Mēlŏ-cactus; Mēlŏn-gena: Xylo-mēlŭm.
Mĕlŏs (μέλος), a limb, member	Aniso-mĕles, Hetero-mĕles, Octo-mĕles, Tetra-mĕles.
Mĕrĭs, mĕrĭdŏs (μερίς, μερίδος), a part	Actino-mĕrĭs, Hemi-mĕrĭs, Iso-mĕrĭs, micro-mĕrĭs; Crypto-mĕrĭa, Lepto-mĕrĭa; Tetra-mĕrĭŭm.
Mĕsŏs (μέτος), middle	Mĕsŏ-chlæna, mĕsŏ-chloa, mĕsŏ-leucum, Mĕsŏ-spinidium;
Mīcrŏs (μικρός), little	Mīcr-andra, mīcr-antha, Mīcr-anthera; Mīcrŏ-coccus; Mīcrŏ-loma, Mīcrŏ-myrtus: Tetra-mīcra.
Mŏnŏs (μόνος), alone, solitary	mŏn-acantha, mŏn-adelpha, Mŏn-orchis; mŏnŏ-ceras, mŏnŏ-chlamys, Mŏnŏ-chilus, Mŏnŏ-lophus.
Mўcēs, mўcētŏs (μύκης, μύκητος), a mushroom	Choiro-mўcēs, Hypo-mўcēs, Saccharo-mўcēs, Uro-mўcēs; Asco-mўcētes, Disco-mўcētes, Schizo-mўcētes.
Mўrĭŏs (μυρίος), countless	mўrĭ-acantha, Mўrĭ-adenus; Mўrĭŏ-cephalus.
Mўrŏn (μύρον), sweet ointment	Mўrŏ-balanus, Mўrŏ-broma, Mўrŏ-spermum, Mўrŏ-xylon.
Mўs, mўŏs (μῦς, μυός), a mouse	Mўŏ-porum, Mўŏ-seris; Mўŏs-otis, Mўŏs-urus.
Nēma, nēmătŏs (νῆμα, νέματος), a thread	Nēm-aconia; Nēmă-stylis; Nēmŏ-stylis; Nēmăt-anthus; Nēmătŏ-phyllum: Actino-nēma, Cyclo-nēma.
Nĕphrŏs (νεφρός), a kidney	Nĕphr-andra, Nĕphr-anthera; Nĕphrŏ-lepis.
Nŏthŏs (νόθος), bastard, spurious	Nŏthŏ-chlæna, Nŏthŏ-læna, Nŏthŏ-lirion, Nŏthŏ-scordum.
Nŏtŏs (νότος), the South; nŏtĭŏs (νότιος), moist southern	Nŏt-elæa; Nŏtŏ-spartium; Nŏtĭ-ophrys; Nŏtĭŏ-sphace.
Nōtŏs (νῶτος), the back	Nōtŏ-ceras; Nōt-odonta: Spilo-nōta; Lysio-nōtus.
Ŏdous, ŏdŏntŏs (ὀδούς, ὀδόντος), a tooth	Ŏdŏnt-adenia, Ŏdŏnt-arrhena; Ŏdŏntŏ-glossum, Ŏdŏntŏ-loma: ambly-ŏdŏn, Brachy-ŏdŏn, Leont-ŏdŏn.
Ŏlĭgŏs (ὀλίγος), little	Ŏlĭg-antha, Ŏlĭg-osma; Ŏlĭgŏ-scias, ŏlĭgŏ-trichum.
Ŏmphălŏs (ὀμφαλός), the navel	Ŏmphăl-andria, Ŏmphăl-ia; Ŏmphălŏ-bium.
Ŏnŏs (ὄνος), an ass	Ŏnŏ-broma, Ŏnŏ-brychis, Ŏnŏ-pordon, Ŏnŏ-seris.
Ŏnўx, ŏnўchŏs (ὄνυξ, ὄνυχος), a claw	Ŏnўch-ium; Ŏnўchŏ-sepalum: Dipl-ŏnyx, platy-ŏnyx.
Ŏphis, ŏphĭŏs (ὄφις, ὄφιος), a snake	Ŏphĭŏ-caryon, Ŏphĭŏ-desma, Ŏphĭŏ-glossum, Ŏphĭŏ-pogon.
Ŏrnĭs, ŏrnĭthŏs (ὄρνις, ὄρνιθος), a bird	Ŏrnĭth-idium; Ŏrnĭthŏ-cephalus, Ŏrnĭthŏ-chilus, Ŏrnĭthŏ-galum, Ŏrnĭthŏ-pteris; tri-ŏrnĭthŏ-phora.
Oura *or* ūra (ὄυρα), the tail	Ūrŏ-cystis, Ūrŏ-petalum, Ūrŏ-spatha: Di-ūrĭs, Hipp-ūrĭs; Ather-ūrŭs, Lag-ūrŭs, Myos-ūrŭs, Scorpi-ūrŭs.
Ous, ōtŏs (ὄυς, ὠτός), an ear	Ōt-acanthus, Ōt-andra, Ōt-anthus; Ōtŏ-chilus, Ōtŏ-stemma: Arct-ōtĭs, Di-ōtĭs, Leon-ōtĭs.
Ŏxўs (ὀξύς), sharp, acid	Ŏxў-acantha, Ŏxў-cedrus, Ŏxў-dendron, Ŏxў-spora.
Păchўs (παχύς), thick	păchў-antha, Păchў-chilus, Păchў-loma; Păchўs-andra.
Pănax, pănăcŏs (πάναξ, πάνακος), panacea, all-heal	[pănăx. Pănăx: Mono-pănăx, Opo-pănăx, Oreo-pănăx, Pseudo-
Pără (παρά), beside, like	Pără-caryum, Pără-gramma, Pără-nomus, Pără-tropia.
Pĕdīlŏn (πέδιλον), a shoe	Pĕdīl-anthus, Pĕdīl-ea; Pĕdīlŏn-ia.
Pēra (πήρα), a wallet	Pēră-nema: Acro-pēra, Cyrto-pēra.
Pĕrĭ (περί), round	pĕrĭ-acanthus, Pĕrĭ-clymenum, Pĕrĭ-ploca, Pĕrĭ-stylis.
Pĕtălon (πέταλον), a leaf, petal	Pĕtăl-acte; Pĕtălŏ-lepis, Pĕtălŏ-stemon: Deca-pĕtăla; Oxy-pĕtălŭm, Uro-pĕtălŭm, Zygo-pĕtălŭm.
Phĭlŏs (φίλος), fond	Phĭl-adelphus; Phĭlŏ-dendron, Phĭlŏ-gyne: Ægi-phĭla, Chima-phĭla, Nemo-phĭla, Scia-phĭla; Geo-phĭlŭs.
Phlĕps, phlĕbos (φλέψ, φλεβός), a vein	Phlĕbĭ-gonium; Phlĕbĭŏ-phyllum: Eu-phlĕbĭa, Phanero-phlĕbĭa; Gonio-phlĕbĭŭm, Hetero-phlĕbĭŭm.

Pronouncing Dictionary—*continued.*

Root-word.	Examples of Derivatives.
Phŏrŏs (*φορός*), bearing, producing	Phŏrŏ-lobus: Adeno-phŏra, Botryo-phŏra; Acro-phŏrŭs, Belo-phŏrŭs; Erio-phŏrŭm, Stephano-phŏrŭm.
Phўllon (*φύλλον*), a leaf	Phўll-achne, Phўll-amphora; Phўllŏ-cactus, Phўllŏ-calyx: Cerato-phўlla; Penta-phўllŏn; Platy-phўllŏs; Podo-phўllŭm; Caryo-phўllŭs.
Phўsa (*φῦσα*), a bladder, bellows	Phўsă-pteris; Phўsŏ-poda, Phўsŏ-spermum: Di-phўsa; Stephano-phўsŭm.
Phўtŏn (*φυτόν*), a plant	Phўt-elephas; Phўtŏ-crene: rhizo-phўta, Xero-phўta; Argyro-phўtŏn; Anoplo-phўtŭm, Chloro-phўtŭm.
Pīlŏs (*πῖλος*), a hat	Pīlĕ-anthus, pīlĕŏ-rhiza; Pīlŏ-carpus, Pīlŏ-phora.
Pĭtўs, Pĭtўŏs (*πίτυς, πίτυος*), a pine-tree	Pĭtў-opsis: Chamæ-pĭtўs, Prumno-pĭtўs, Sciado-pĭtўs.
Plăgĭŏs (*πλάγιος*), oblique	Plăgĭ-anthus; Plăgĭŏ-lirion, Plăgĭŏ-lobium.
Plătўs (*πλατύς*), flat, broad	plătў-acantha, Plătў-chilum, plătў-rhynchos.
Plĕctŏs (*πλεκτός*), twisted	Plĕctŏ-cephalus, Plĕctŏ-gyne, plĕctŏ-lepis: Cheilo-plĕctŏn.
Plōctrŏn (*πλῆκτρον*), a spur	Plōctr-anthera, Plōctr-anthus, Plōctr-itis, Plōctr-urus.
Plŏcē (*πλοκή*), a twining	Plŏcŏ-glottis, Plŏcŏ-stemma: Peri-plŏca; Sym-plŏcŏs.
Pōgōn, pōgōnŏs (*πώγων, πώγωνος*), a beard	Pōgō-gyne; Pōgōn-ia; Pōgōnŏ-pus: Andro-pōgōn.
Pŏlўs (*πολύς*), much, many	pŏlў-acantha, Pŏlў-anthus, Pŏlў-gala, Pŏlў-gonum.
Pŏrŏs (*πόρος*), a passage, ford	Pŏr-anthera; Pŏrŏ-stema: Myo-pŏrŭm; Poly-pŏrŭs.
Pŏrphўrĕŏs (*πορφύρεος*), purple	pŏrphўr-antha; Pŏrphўrŏ-coma, Pŏrphўrŏ-stachys.
Pous or pūs, pŏdŏs (*πούς, ποδός*), a foot	Pŏd-anthus; Pŏdĭ-soma; Pŏdŏ-carpus, Pŏdŏ-phyllum: Brachy-pŏda; Cheno-pŏdĭŭm, Lyco-pŏdĭŭm, Poly-pŏdĭŭm; Corono-pūs, Lago-pūs, Ornitho-pūs.
Prăsŏn (*πράσον*), a leek	Prăs-anthea; Prăsŏ-phyllum: Schœno-prăsŭm.
Psīlŏs (*ψιλός*), bare	Psīla; Psīlŏ-gyne, Psīlŏ-stoma; Psīlŏs-anthus.
Psўchē (*ψυχή*), the soul, a butterfly	Psўchē, Psўche-chilus; Psўchŏ-trophum: Calli-psўchē.
Ptĕrĭs, ptĕrĭdŏs (*πτέρις, πτέριδος*), a fern	Ptĕrĭs; ptĕrĭdĭ-folia: Acino-ptĕrĭs, Acro-ptĕrĭs, Angio-ptĕrĭs, Cysto-ptĕrĭs, Struthio-ptĕrĭs. [Ano-ptĕrŭs.
Ptĕrŏn (*πτερόν*), a feather, leaf	Ptĕrŏ-carpus, Ptĕrŏ-phyton: Cato-ptĕrŏn; Heli-ptĕrŭm;
Ptĕryx, Ptĕrўgŏs (*πτερύξ, πτέρυγος*), a wing	Ptĕrўgŏ-calyx: Tetra-ptĕrўgĭŭm; Tetra-ptĕrўs.
Ptĭlŏn (*πτίλον*), a feather	Ptĭlŏ-cnema, Ptĭlŏ-stephium, Ptĭlŏ-trichum: Acro-ptĭlŏn.
Pўr, pўrŏs (*πῦρ, πυρός*), a fire	Pўr-acantha, Pўr-alis, Pўr-ethrum; Pўrŏ-lirion, Pўrŏ-stegia. [pўrēnum
Pўrēn, pўrēnŏs (*πυρήν, πυρῆνος*), a kernel, fruit-stone	Pўrēnŏ-mycetes: Cato-pўrēnĭum, Endo-pўrēnĭum, mono-
Pўrŏs (*πυρός*), Wheat	Agro-pўrum, Hydro-pўrum, Iso-pўrum, Lepto-pўrum, Melam-pўrum; leuco-pўrus.
Răchĭs *or* rhăchĭs, rhăchĭos (*ῥάχις, ῥάχιος*), the back	răchĭ-rhizon: erythro-răchĭs.
Răphĭs *or* rhăphĭs, rhăphĭdŏs (*ῥαφίς, ῥαφίδος*), a needle	Răphĭ-stemma; răphĭd-acantha; Răphĭdŏ-phora, Rhăphĭdŏ-phora; Răphĭŏ-lepis, Rhăphĭŏ-lepis: Pĕnta-răphĭă, Penta-rhăphĭă.
Rhīs, rhīnos (*ῥίς, ῥινος*), the nose	Rhīn-acanthus; Rhīnŏ-petalum: Antir-rhīnum.
Rhīza (*ῥίζα*), a root	Rhīzŏ-bius, Rhīzŏ-phora: Acantho-rhīza; Glycy-rhīza; Xantho-rhīza; macro-rhīzon; Pachy-rhīzus.
Rhŏdŏn (*ῥόδον*), a rose	Rhŏdŏ-dendron, Rhŏdŏ-rhiza, Rhŏdŏ-thamnus: leuco-rhŏda, melano-rhŏda; Chamæ-rhŏdŏs.
Rīpĭs *or* rhīpĭs, rhīpĭdŏs (*ῥιπίς, ῥιπίδος*), a fan	Rīpĭd-ium; Rhīpĭdŏ-dendron, Rhīpĭdŏ-ptæris.
Rōps *or* rhōps, rhōpŏs (*ῥώψ, ῥωπός*), a shrub	Chamæ-rōps, Dæmono-rōps. [scăphis.
Scăphē (*σκάφη*), a boat, skiff (Latin, scapha)	Scăpha; scăphĭ-gera; Scăphў-glottis: Loxo-scăpha; Eu-
Scĭas, scĭădŏs (*σκιάς, σκιάδος*), a shade, an umbrella	Scĭădŏ-calyx, Scĭădŏ-phyllum, Scĭădŏ-pitys, Oligo-scĭas.
Sēma *and* sēmeiŏn (*σῆμα and σημεῖον*), a mark	Sēmē-carpus; Sēmei-andra: Brachy-sēma, Erio-sēma Steno-sēmĭa.
Sĕrĭs (*σέρις*), Succory	Sĕrĭs: Dendro-sĕrĭs, Lago-sĕrĭs, Ono-sĕrĭs.
Sĭdērŏs (*σίδηρος*), iron	Sĭdēr-itis; Sĭdērŏ-dendron, Sĭdērŏ-xylon: Metro-sĭdērŏs.
Sĭphōn, sĭphōnŏs (*σίφων, σίφωνος*), a reed, tube (Latin, sīpho)	Sĭpho, Sĭpho-campylos; Sĭphōn-andra, Sĭphōn-antha; Sĭphōnŏ-phora: Lepto-sĭphōn, Ortho-sĭphōn, Physo-sĭphōn.
Sītŏs (*σῖτος*), Wheat	Sītŏ-codium, Sītŏ-bolium, Sītŏ-lobium.
Sōlēn, sōlēnŏs (*σωλήν, σωλῆνος*), a pipe	Sōlēna; Sōlēn-andra, Sōlēn-idium; Sōlēnŏ-phora: Strepto-sōlēn; Steno-sōlēnĭŭm.
Sōrŏs (*σωρός*), a heap	Sōrŏ-cephalus, Sōrŏ-manes, Sōrŏ-sporium: Odonto-sōrĭa; plesio-sōrŭm; Allo-sōrŭs, Crypto-sōrŭs, Tricho-sōrus.

Pronouncing Dictionary—*continued.*

Root-word.	Examples of Derivatives.
Spăthē (*σπάθη*), a blade, flower-sheath (Latin, spatha)	Spăth-acea, Spăth-antheum; Spăthĭ-carpa, Spăthĭ-phyllum; Spăthŏ-glottis: Argo-spătha, Brachy-spătha, Rhodo-spătha; Hetero-spăthe, Hyo-spăthe.
Sphēn, sphēnŏs (*σφήν, σφηνός*), a wedge . . .	Sphēn-andra; Sphēnŏ-desma, Sphēnŏ-gyne, Sphēnŏ-toma.
Spīlŏs (*σπῖλος*), a spot	Spīl-anthes; Spīlŏ-nota, spīlŏ-pterum, Spīlŏ-soma.
Spīra *or* speira (*σπεῖρα*), a coil	Spīr-æa, Spīr-anthera; Spīrŏ-conus, Spīrŏ-stemon.
Spŏră (*σπορά*), a seed	Spŏrŏ-bolus: Chori-spŏra, Clado-spŏra; Pitto-spŏrum.
Stăchys, stăchўŏs (*στάχυς, στάχυος*), an ear of corn	Stăchys; Stăchў-urus; Stăchўŏ-pogon: Calli-stăchys, Echino-stăchys, Gymno-stăchys; Lepto-stăchўa; Acantho-stăchўŭm, Gymno-stăchĭŭm.
Stăphўlē (*σταφυλή*), a cluster of grapes . . .	Stăphўl-ea, Stăphyl-inus: Comaro-stăphўlis; Arcto-stăphўlŏs.
Stĕgē (*στέγη*), a covering	Stĕg-osia: Caly-stĕgia, Cono-stĕgia, Crypto-stĕgia, Leuco-stĕgia, Physo-stĕgia.
Stĕmma, stĕmmătŏs (*στέμμα, στέμματος*), a wreath	Stĕmmăt-ium: Agro-stĕmma, Calli-stĕmma, Crypto-stĕmma, Sarco-stĕmma.
Stēma, stēmătŏs (*στῆμα, στήματος*), *and* Stēmōn, stēmŏnos (*στήμων, στήμονος*), } the warp, a stamen	Stēmŏn-a, Stēmŏn-acanthus: Centro-stēmă, micro-stēmă; ampho-stēmōn, Cyclo-stēmōn, Pent-stēmōn; Steno-stēmŭm.
Stĕnŏs (*στενός*), narrow	Stĕnŏ-carpus, Stĕnŏ-chilus, Stĕnŏ-glossum, Stĕnŏ-loma, Stĕnŏ-rhynchus.
Stĕphŏs (*στέφος*), *and* Stĕphănē (*στεφάνη*) } a crown	Stĕphăn-andra; Stĕphănŏ-coma, Stĕphănŏ-lirion: Andro-stĕphĭum, Ptilo-stĕphĭŭm; Calli-stĕphŭs; A-stĕph-ănus.
Stĭchŏs (*στίχος*), a row, line	Stĭchŏ-neuron: Acro-stĭchŭm, Di-stĭchŭm, Poly-stĭchŭm.
Stŏma, stŏmătŏs (*στόμα, στόματος*), the mouth .	Adeno-stŏma, Chæno-stŏma, Mela-stŏma, Pachy-stŏma.
Strŏbĭlŏs (*στρόβιλος*), a fir-cone (Latin, strobĭlus)	Strŏbĭla; Strŏbĭl-anthes; Strŏbĭlŏ-rachis.
Strŏbŏs (*στρόβος*), a top [cone] (Latin, strobus)	Strŏbŭs; Strŏbŏ-clinium: Actino-strŏbŭs, Glypto-strŏbŭs.
Stўlŏs (*στῦλος*), a pillar, style	Stўl-andra, Stўl-urus; Stўlŏ-coryne, Stўlŏ-lepis: Bulbo-stўlĭs, Crypto-stўlĭs, Micro-stўlĭs, Peri-stўlĭs.
Sўrĭnx, sўrĭngŏs (*σῦριγξ, σύριγγος*), a pipe . .	Sўrĭnga; sўrĭng-ella, Sўrĭng-odea; sўrĭngĭ-folia; sўrĭngŏ-thyrsis.
Thēcē (*θήκη*), a case, sheath (Latin, thēca) . .	Thēcŏ-stele: Anoma-thēca, Arcto-thēca, Gymno-thēca, Hetero-thēca, Platy-thēca.
Thēlē (*θηλή*), a teat	Thēla; Thēlĕ-bolos, Thēlĕ-phora, Thēlĕ-sperma: phymato-thēle, Sphæro-thēle.
Thēlўs (*θῆλυς*), female	Thēlў-gonum, Thēlў-mitra, Thēlў-pogon, Thēlў-pteris.
Thrĭx, trĭchŏs (*θρίξ, τρίχος*), hair	Thrĭx-spermum; Trĭch-antha; Trĭchŏ-cephalus, Trĭchŏ-manes: Acro-trĭche, calli-trĭcha; Eri-trĭchĭŭm, Poly-trĭchŭm; oligo-trĭchŭm; Lepto-thrĭx, Poly-thrĭx.
Tŏmē (*τομή*), a cut	Calyco-tŏme, Hetero-tŏma, Iso-tŏma, Peri-tŏma, Spheno-tŏma; Bu-tŏmŭs.
Trāchўs (*τραχύς*), rough	Trāchў-carpus, Trāchў-mene, Trāchў-notia, Trāchў-stemon.
Trăgŏs (*τράγος*), a he-goat	Trăg-ia, Trăg-acantha, Trăg-us; Trăgŏ-pogon.
Trŏpĭs, trŏpĭdŏs (*τρόπις, τρόπιδος*), a keel . . .	Trŏpĭd-ia: Calo-trŏpĭs, Iso-trŏpĭs, Macro-trŏpĭs, Oxy-trŏpĭs.
Tўlŏs (*τύλος*), a knot	Tўlŏ-chilus, Tўlŏ-glossa, Tўlŏ-phora.
Xērŏs (*ξηρός*), dry	Xēr-andra, Xēr-anthemum; Xērŏ-nema, Xērŏ-phyllum, Xērŏ-phyta.
Xĭphŏs (*ξίφος*), a sword	Xĭph-idium, Xĭph-ion, Xĭphŏ-pteris, Xĭphŏ-stachys: Dictyo-xĭphĭŭm.
Xўlŏn (*ξυλόν*), wood	Xўl-acantha; Xўlŏ-bium, Xўlŏ-melum, Xўlŏ-phylla: Capro-xўlŏn, Chloro-xўlŏn, Hæmato-xўlŏn, Sidero-xўlŏn; Cithare-xўlŭm, Xantho-xўlŭm.
Zēmĭa (*ζημία*), loss (Latin, Zāmia)	Zāmĭa; Zāmĭŏ-culcas: Cerato-zāmĭa, Macro-zāmĭa, Platy-zāmĭa.
Zōstēr, zōstērŏs (*ζωστήρ, ζωστῆρος*), a belt . .	Zōstēra; zōstēræ-folia; Zōstērŏ-spermum, Zōstērŏ-stylis.
Zўgŏn (*ζυγόν*), a yoke	Zўg-adenus; Zўgŏ-glossum, Zўgŏ-petalum, Zўgŏ-phyllum: Tetra-zўgĭa.

Pronouncing Dictionary—*continued.*

BIBLIOGRAPHY

Of Works used for the Derivation and Accentuation of Generic and Specific Names.

This Bibliographical List contains the titles of works useful for the study of plant-names; most of them fall under the following heads:—

(1) Books in which we find the old classical names of plants, such as those of the ancient authors Theophrastus, Virgil, Pliny, and the moderns Fraas, Sprengel, Lenz, &c.

(2) Those of writers who supply information on the so-called barbarous native names, such as Aublet and Seemann for American names; Siebold and Kaempfer for Japanese; Bretschneider for Chinese, &c.

(3) The books which afford particulars as to commemorative names and the lives of the men thus honoured—*see* Haller, Böhmer, Pritzel, &c.

(4) General works which give the derivation and pronunciation of botanical names. Some of these may be found under the names Wittstein, Glaser, Paxton, Loudon.

(5) National Floras, which are authorities especially for names commemorative of men belonging to the respective nations, as for England, Withering and Hooker; Germany, Koch; Italy, Arcangeli; Sweden, Nyman.

(6) Treatises dealing with the special pronunciation of Latin, as advocated in this Dictionary. A few of these, though not connected directly with botany, have been inserted for convenience of reference—Ellis, Haldeman, Roby, Smith, Kennedy.

It has not been thought worth while to mention the authorities for the comparatively few zoological names (principally those of insects) which occur in the Dictionary.

Some of the works enumerated have been but little used; but all of them have been consulted more or less. The edition actually used has been named in every case; but that is also generally the latest. In order to ascertain the original etymology, reference has been made, in very numerous instances, to the work in which the author originally published the name; but of course the titles of such publications have not been inserted in the list, as doing so would have many times multiplied its present size. For the rare works which were not in the writer's own library, recourse has been had to the admirable Botanical Library in the Natural History Department of the British Museum at South Kensington, to which free access was permitted, and much assistance rendered, through the courtesy of Mr. Carruthers and Mr. Britten.

Adams (Francis). Names of all the Plants, &c., described by the Greek authors. *See* **Dunbar.**

Alcock (Randal H.). Botanical Names for English Readers. London, 1876. 8vo.
A very interesting and suggestive book; several mistaken accents were corrected in a page appended to a reprint.

Apuleius Platonicus, de Veribus Herbarum (2nd title "De Herbarum Virtutibus"). Parisiis, 1543. 8vo.

Arcangeli (Giov.). Compendio della Flora Italiana. Torino, 1882. 8vo.
The derivations of all generic names are given, and they, as well as the specific names, are accented.

Aristoteles. Phytologiæ Aristotelicæ, ed. F. Wimmer. 1838. 8vo.

Aublet (J. B. C. F.). Histoire des Plantes de la Guiane Française. Londres et Paris, 1775. 4 vols. 4to.

Bailly (Anatole). *See* **Bréal and Bailly.**

Bauhin (Caspar). Pinax Theatri Botanici. Basiliæ, 1623. 4to.

Böhmer (G. R.). Commentatio Botanico-literaria de Plantis in memoriam Cultorum nominatis. Lipsiæ, 1799. 8vo.
There is an interesting interleaved copy of a previous edition in the Library of the Botanical Department of the British Museum.

—— Lexicon Rei Herbariæ Tripartitum. Lipsiæ, 1802.
The first of the three parts is an "Etymologia Nominum."

Boulger (G. S.). *See* **Britten and Boulger.**

Bréal (Michel) and Bailly (Anatole). Dictionnaire Etymologique Latin. Paris, 1885. 8vo.

Bretschneider (Ernest). On the Study and Value of Chinese Botanical Works. Foochoo, 1870. 8vo.

—— Botanicon Sinicum. London, 1882. 8vo.
Notes on Chinese botany.

—— Early European Researches into the Flora of China. Hanghai, 1881. 8vo.
These three works are of great value for Chinese native names.

Pronouncing Dictionary—*continued.*

Britten (James). *See* **Turner.**

—— and **Boulger (G. S.).** Biographical Index of British and Irish Botanists (now [1888] appearing in the Journal of Botany).
This work, when completed, will be of great value for all names commemorative of English botanists.

Brown (N. E.). Supplement to Johnson's "Gardeners' Dictionary." London, 1884. 8vo.

—— Index to "English Botany." London, 1886. 8vo.

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Cato (M. Porcius). De Re Rustica. *See* **Rusticæ Rei Scriptores.**

Curtius (Georg.). Grundzüge der Griechischen Etymologie. Leipzig. Ed. 4, 1873. 8vo.

Diefenbach (L.). Novum Glossarium Latino-Germanicum Mediæ et Infimæ Ælatis. Frankfort. 1867. 8vo.

Dierbach (J. H.). Die Arzneimittel des Hippokrates. Heidelberg, 1824. 8vo.

Diez (F.). Lexicon Etymologicum Linguarum Romanorum. Bonn, 1853. 8vo.

Dioscorides. De Materia Medica. Ed. C. Sprengel. Lipsiæ, 1828-30. 2 vols. 8vo.

Du Cange (Dufresne, Seigneur). Glossarium ad Scriptores Mediæ et Infimæ Latinitates. Ed. L. Favre. Niort et Londini, 1882-87. 10 vols. 4to.
Special lists of herbs, trees, &c., in Vol. X.

Dunbar (George). Greek-English Lexicon. London and Edinburgh. Ed. 3, 1850.
Valuable scientific Appendix by Francis Adams.

Earle (John). English Plant-Names from the Tenth to the Fifteenth Century. Oxford, 1880. 8vo.
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Ellis (A. J.). Practical Hints on the Quantitative Pronunciation of Latin. London, 1874. 8vo.

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Fée (Ant. L. A.). La Botanique de Pline. Paris, 1833. 3 vols. 8vo.

Fick (F. C. A.). Vergleichendes Wörterbuch der Indogermanischen Sprachen. Göttingen, 1874-76. 4 vols. 8vo.

Fraas (C.). Synopsis Plantarum Floræ Classicæ. München, 1845. 8vo.

Frank (A. B.). *See* **Leunis.**

Gerard (J.). Herball. London. Ed. 2, by Thos. Johnson, 1633. Fol.

Glaser (L.). Taschenwörterbuch für Botaniker. Leipzig, 1885. 8vo.

Gray (Asa). Manual of the Botany of the Northern United States. New York and Chicago. Ed. 5, 1872.
Gives derivations of genera, and pronunciation of genera and species.

Haldeman (S. S.). Elements of Latin Pronunciation for the use of Students in . . . Zoology, Botany, &c. Philadelphia, 1851. 12mo.

Haller (Albertus). Bibliotheca Botanica. Londini, 1771. 2 vols. 4to.

Hehn (Victor). Wanderings of Plants and Animals from their First Home. Ed. by J. S. Stallybrass. London, 1885. 8vo.
Many erudite notes tracing the derivations of plant-names.

Heldreich (T. von). Die Nutzpflanzen Griechenlands. Athen., 1862. 8vo.

Hemsley (W. B.). Handbook of Hardy Trees, Shrubs, and Herbaceous Plants. London, 1877. 8vo.
Much care bestowed on derivations and accentuation.

Henfrey (Arthur). *See* **Smith.**

Homer. *See* **Bucholz** and **Eucholz.**

Hooker (Sir J. D.). The Student's Flora. London, Ed. 3, 1884. 8vo.
The later editions have had the derivations and accents carefully revised.

Hooker (W. J.) and **Arnott (G. A. W.).** British Flora. London, Ed. 6, 1850.
The derivations given are often very inaccurate.

Pronouncing Dictionary—*continued.*

Jackson (B. Daydon). Guide to the Literature of Botany. London, 1881. 4to.
Exhaustive Index, very helpful for working out commemorative names.

Juillet. *See* **Lecoq et Juillet.**

Jürgens (Karl). Etymologisches Fremdwörterbuch der Pflanzenkunde. Braunschweig, 1878. 8vo.

Kæmpfer (E.). Amœnitates Exoticæ. Lemgoviæ, 1712. 4to.

Kennedy (B. H.). The Public School Latin Grammar. London. Ed. 4, 1876. 8vo.

Kirchner (Oskar). Die Botanischen Schriften des Theophrast. Leipzig, 1874. 8vo.
Several useful lists of names.

Koch (G. D. J.) Synopsis Floræ Germanicæ et Helveticæ. Ed. 3. Lipsiæ, 1857. 8vo.
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Koch (K.). Die Bäume und Sträucher des alten Griechenlands. Stuttgart, 1879. 8vo.

Langkavel (B.). Botanik der Spätern Griechen. Berlin, 1866. 8vo.

Lecoq (H.) et Juillet (J.). Dictionnaire Raisonné des Termes de Botanique. Paris, 1831. 8vo.

Lenz (H. O.). Botanik der alten Griechen und Römer. Gotha, 1859. 8vo.

Leunis (J.). Synopsis der Pflanzenkunde. Ed. 3, by A. B. Frank. Hannover, 1885. 3 vols. 8vo.

Lewis (C. T.) and **Short (C.).** Latin Dictionary. Oxford, 1879. 4to.
The etymological part is superior to that of any other Latin-English Dictionary.

Liddell (H. G.) and **Scott (R.).** A Greek-English Lexicon. Oxford, 1883. 4to.
This standard Greek Lexicon is very meagre in its botanical references.

Lindley (J.). *See* **Loudon** and **Paxton.**

Linnæus (C.). Critica Botanica. Lugduni Batavorum, 1737. 8vo.

—— Philosophia Botanica. Holmiæ, 1751. 8vo.
These two works contain a great mass of information concerning the derivation of the Linnean names for genera and species.

Loudon (J. C.). Encyclopædia of Plants. London, 1829. 8vo.
"Professor Lindley . . . prepared the derivations and accentuations."—*Preface.*

—— Hortus Britannicus. London, Ed. 3, 1839. 8vo.

Macer. "De Viribus Herbarum" and Strabo's "Hortulus." Lugdun., 1530. 12mo.

MacNicoll (D. H.). Dictionary of Natural History Terms. London, 1863.

Maigne d'Arnis (W. H.). Lexicon Manuale ad Scriptores Mediæ et Infimæ Latinitatis. Paris, 1866. 8vo.

Martyn (Thos.). The Language of Botany. London, 1793. 8vo.

Meyer (E. H. F.). Geschichte der Botanik. Königsberg, 1854-7. 4 vols. 8vo.
Very full in the earlier parts.

—— Botanische Erläuterungen zu Strabo's Geographis.

Müller (F. Max). Biographies of Words and Primitive Home of the Aryas. London, 1887. 8vo.
Interesting Aryan plant-lists.

Müller (J. B.). Botanische prosodische Wörterbuch. 1842.

Nemnich (P. A.). Allgemeines Polyglotten—Lexicon der Naturgeschichte. Leipzig, 1793-8. 4 vols. 4to.

Nyman (C. F). Svensk Fanerogam-Flora. Oerebro, 1873. 8vo.
Generic and specific names accented.

Paxton (Jos.). Pocket Botanical Dictionary. London, 1840. 8vo.
"The accentuation-marks . . . all supplied by the first botanist in England, Dr. Lindley."—*Preface.*

Pfeiffer (L.). Nomenclator Botanicus. Cassellis, 1872-4. 2 vols. 4to.
Contains many brief etymologies, inserted apparently on no settled principle.

Pronouncing Dictionary—*continued.*

Phillips (L. B.). Dictionary of Biographical Reference, containing 100,000 names. London, 1871. 8vo.

Pickering (C.). Chronological History of Plants. Boston, 1879. 8vo.
An immense mass of information, but the index of foreign plant-names is quite inadequate.

Pictet (Ad.). Les Origines Indo-Européennes, ou les Aryas Primitifs. Paris. Ed. 2, 1878. 3 vols.
Special attention is paid to ancient names of plants.

Piddington (H.). English Index to the Plants of India. Calcutta, 1832. 8vo.

Plinius Secundus (C.). Historia Naturalis. D. Detlefsen recensuit. Berol., 1866-82. 8vo.

—— [**Pline**]. *See* **Fée.**

—— [**Pliny**]. Natural History. Translated by J. Bostock and H. T. Riley. London, 1855. 6 vols. 8vo.
Many notes on botanical matters, largely copied from Fée and Sprengel.

Prior (R. C. A.). Popular Names of British Plants. London. Ed. 3, 1879. 8vo.
Treats incidentally of the etymology of many scientific names.

Pritzel (G. A.). Thesaurus Literaturæ Botanicæ. Lipsiæ. Ed. 2, by Jessen. 1872-7. 4to.
The great authority for commemorative names.

Promptorium Parvulorum, Lexicon Anglo-Latinum princeps. London, 1843-65. 3 vols. 4to.

Räuschel. Nomenclator Botanicus Omnium a Linnæo Descriptarum Plantarum. Lipsiæ, 1797. 8vo.

Roby (H. J.). A Grammar of the Latin Language, from Plautus to Suetonius. Part I. London. Ed. 5, 1887. 8vo.

Roxburgh (W.). Flora Indica. Serampore, 1832. 3 vols. 8vo.

Rusticæ Rei Scriptores Veteres Latini. Lipsiæ, 1794-97. 7 vols. 8vo.
Contains Cato, Varro, Columella, &c., with very copious "Index Rerum et Vocabulorum."

Saalfeld (G. A. E. A.). Tensaurus Italo-Græcus. Wien., 1884. 8vo.
A very full list of Latin words borrowed from Greek, including a large number of plant-names.

Saint-Lager (Dr.). Reforme de la Nomenclature Botanique. Lyon, 1880. 8vo.
Attaches much importance to the Greek words from which most generic names are derived.

Salomon (Carl). Wörterbuch der Botanischen Kunstsprache. Stuttgart, 1886. 12mo.

—— Wörterbuch der Botanischen Gattungsnamen. Stuttgart, 1887. 12mo.
These two little books, the last German publications dealing with the subject, give the accentuation of many specific and generic names, but very incorrectly.

Seemann (Berthold). Die Volksnamen der Amerikanischen Pflanzen. Hannover, 1851. 8vo.
Only a fragment of the work projected.

Siebold (Ph. Fr. de). Flora Japonica. Lugdun. Batavorum, 1835 and 1870. 2 vols. Fol.

Skeat (W. W.). Etymological Dictionary of the English Language. Oxford. Ed. 2, 1884. 4to.
Clears up many doubtful derivations.

Pronouncing Dictionary—*continued.*

Smith (W.). Latin-English Dictionary.
The botanical portion was specially prepared by Professor Arthur Henfrey.

—— and **Hall (T. D.).** The Student's Latin Grammar. London. Ed. 13, 1885. 8vo.

Sprengel (Curt.). Historia Rei Herbariæ. Amsteld., 1807. 2 vols. 8vo.
The first volume, with its valuable indexes, has been of great service.

Strabo. *See* **Meyer.**

Strabo (Walafrid). *See* **Macer.**

Théis (Alex. de). Glossaire de Botanique, ou Dictionnaire Etymologique. Paris, 1810. 8vo.
A very interesting book, dealing with the derivations of specific as well as generic names. It has been freely quarried from by subsequent writers on the subject.

Theophrasti Opera. Ed. F. Wimmar. Paris, 1866. 8vo.
A very useful edition, with Index containing the views of Sprengel, Fraas, and Fée on the identification of Theophrastus' plants.

Turner (W.). The Names of Herbes [A.D. 1548]. Ed. James Britten. London, 1881. 8vo.
Easily consulted by means of the thorough indexes appended by the editor.

Vaniček (Alois). Etymologisches Wörterbuch der Lateineschen Sprache. Leipzig, 1874. 8vo.

—— Griechisch-Lateinisches Etymologisches Wörterbuch. Leipzig, 1877-78. 2 vols. 8vo.

Varro (Ter.). De Re Rustica. *See* **Rusticæ Rei Scriptores.**

Virgil. *See* **Fée** and **Rubiani.**

Virgiliis Opera. Ed. J. B. Greenough. Boston, 1882. 8vo.
Contains a special Glossary of the plants mentioned by Virgil.

Walafrid Strabo. *See* **Macer.**

Watson (J. Forbes). Index to the Native and Scientific Names of Indian Plants. London, 1868. 4to.

Wharton (E. R.). Etyma Græca. London, 1882. 8vo.
Gives the correct etymology of many old Greek plant-names.

White (J. T.) and **Riddle (J. E.).** Latin-English Dictionary. London. Ed. 4, 1872. 2 vols. 8vo.
Very copious, but with many unsound etymologies.

Withering (Wm.). Systematic Arrangement of British Plants. Birmingham. Ed. 5, 1812. 4 vols. 8vo.
Gives special rules for pronunciation, and accentuates both genera and species throughout.

Wittstein (G. C.). Etymologisch-botanisches Handwörterbuch. Ausbach, 1852. 8vo. ("Editio 2, 1856, non differt."—*Pritzel.*)
The most valuable foreign authority for the derivation of generic names.

Wright (T.). Anglo-Saxon and Old English Vocabularies. Ed. 2, by R. P. Walcker. London, 1884. 2 vols. 8vo.

Yeats (J.). Natural History of Raw Materials of Commerce. London. Ed. 2, 1887. 8vo.
Appendix of native names.

AN INDEX TO

HERBACEOUS PLANTS FOR SPECIAL PURPOSES.

TO obviate the necessity of looking through the whole of the DICTIONARY OF GARDENING in order to make a selection of herbaceous plants suitable for any special purpose, lists are here given of subjects which are adapted to various situations, or are good for particular purposes.

Very few plants except those which have been distinguished in the body of this work by an asterisk as specially desirable are included hereunder; the exceptions being those which, though perhaps not the best of the species, are yet very useful for the purpose indicated. Orchids, Ferns, Lycopods, and Succulents (with the exception of some of the dwarf rockery plants, *e.g.*, Sedums and Sempervivums) are not included here, but are separately classified further on in the Supplement.

Whether the plant is especially useful for its flowers, fruit, or foliage is shown by the descriptive letters which follow the name. In order to avoid a multiplicity of abbreviations, the different tints of the flowers have been grouped, *e.g.*, vermilion, scarlet, and carmine are described as red (*r*), and rose-colour included with pink (*pi*), while all shades of yellow are simply denoted by *y*. For more detailed information as to colours of flowers, the reader is referred to the classification given further on in this volume. Where blossoms exhibit an admixture of two or more colours, the prevailing or ground colour is placed first.

Thus it will be seen that if a reader wish to make a selection of suitable plants for a special purpose he has ready to his hand such an index as will enable him to complete his work with the least possible trouble and with a certainty that the result will be satisfactory.

The following are the abbreviations used in this division:

aq, aquatic; *b*, blue; *bk*, black; *br*, brown; *c*, cream; *c-h*, cool house; *fl*, flowers; *fol*, foliage; *fr*, fruits; *g*, green; *gl*, glaucous; *gy*, grey; *i-h*, intermediate house; *l*, lilac; *m*, magenta; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *s-aq*, semi-aquatic; *sc*, scented; *si*, silvery; *st*, stove; *v*, violet; *w*, white; *y*, yellow.

BOGS AND WATER.—Under this heading are included a good selection of herbaceous plants that require to be grown in water, or to be planted in marshy or boggy situations. They are classified according to hardiness and duration; and aquatics (those which grow in water) and semi-aquatics (subjects requiring damp soil or a marshy situation, or to grow on the margins of lakes

Bogs and Water—*continued.*

or streams) are further distinguished by the abbreviations *aq* and *s-aq*.

Hardy.—ANNUALS.—Malcolmia maritima (*s-aq, fl l, pi, r*, or *w*); Samolus Valerandi (*aq, fl w*); Saxifraga Cymbalaria (*s-aq, fl y*); Trapa natans (*aq, fr*; *fol g*); T. verbanensis (*aq, fr*; *fol g*).

Bogs and Water (Hardy)—*continued.*

BIENNIAL.—Sabbatia calycosa (*s-aq, fl w*).

PERENNIALS.—Acorus Calamus (*aq, fol y* and *g* striated); A. gramineus (*aq, fol g*); A. g. variegatus (*aq, fol g*, striped *w*); Alisma natans (*aq, fl w*); A. Plantago (*aq, fl pi*); Anagallis tenella (*s-aq, fl pi*); Anemone rivulàris (*s-aq, fl w, p* anthers); A. virginiana (*s-aq, fl p* or *p-g*); Aponogeton distachyon (*aq, fl w, sc*); Arnica foliosa (*s-aq, fl y*); Asclepias incarnata (*s-aq, fl r* or *p*); Astilbe rivularis (*s-aq, fl y-w* or *r*); Astrantia carniolica (*s-aq, fl w*; *fol g*, tinged *r*); A. helleborifolia (*s-aq, fl pi*); A. major (*s-aq, fl pi*); Butomus umbellatus (*aq, fl pi*); Calla palustris (*aq, fl w*); Caltha leptosepala (*s-aq, fl w*); C. palustris (*s-aq, fl y*); C. p. biflora (*s-aq, fl y*); C. p. parnassifolia (*s-aq, fl y*); C. radicans (*s-aq, fl y*); Cardamine pratensis (*s-aq, fl p* or *w*); Carex pseudo-cyperus (*s-aq, fl*); C. riparia (*s-aq, fl*); Corydalis solida (*s-aq, fl p*); Cyperus longus (*s-aq, fol g*); Diphylleia cymosa (*s-aq, fl w*); Heteranthera limosa (*s-aq, fl v-b*); Hottonia palustris (*aq, fl l, y* eye); Iris lævigata (*s-aq, fl p*, blotched *y*); I. Pseudo-acorus (*s-aq, fl y, o*, and *g*); Juncus lætevirens (*s-aq, fol g*); Limnanthemum nymphæoides (*aq, fl y*); Lysimachia atropurpurea (*s-aq, fl p*); L. barystachys (*s-aq, fl w*); L. ciliata (*s-aq, fl y*); L. clethroides (*s-aq, fl w*); L. punctata (*s-aq, fl y*); L. vulgaris (*s-aq, fl y*); Lythrum Salicaria (*s-aq, fl r-p*); Mimulus cardinalis (*s-aq, fl r*); M. Lewisii (*s-aq, fl pi*); M. moschatus (*s-aq, fl w*); Myosotis palustris (*s-aq, fl b, y* throat); Nuphar advena (*aq, fl y, r* anthers); N. luteum (*aq, fl y, sc*); Nymphæa alba (*aq, fl w*); N. a. rosea (*aq, fl pi*); N. odorata (*aq, fl w*, tinged *pi, sc*); N. pygmæa (*aq, fl w, sc*); Podophyllum Emodi (*s-aq, fl w, fr r*); Polygonum sachalinense (*s-aq, fl g-y*); Pontederia cordata (*aq, fl b* or *w*; *fol g*); Primula involucrata (*s-aq, fl c-w, y* eye); P. i. Munroi (*s-aq, fl w, y* eye, *sc*); P. luteola (*s-aq, fl y*); Sagittaria heterophylla (*s-aq, fl w*); S. sagittifolia (*aq, fl w, p* claws); Scirpus lacustris (*aq, fl br*); S. Tabernæmontani zebrinus (*s-aq, fol w* and *g*); Typha angustifolia (*aq, fl br*).

Half-Hardy.—ANNUAL.—Vallisneria spiralis (*aq, fl w*; *fol g*).

PERENNIAL.—Thalia dealbata (*aq, fl p*; *fol g*).

Tender.—ANNUALS.—Euryale ferox (*st, aq, fl v*; *fol g*); Tytonia natans (*st, aq, fl r, w*, and *y*); Victoria regia (*st, aq, fl w*, and *p* or *pi*; *fol g*).

PERENNIALS.—Actinocarpus minor (*c-h, aq, fl w*); Aponogeton spathaceum junceum (*c-h, aq, fl pi*); Cabomba aquatica (*i-h, aq, fl y*); Eichhornia azurea (*st, aq, fl b*; *fol g*); E. crassipes (*st, aq, fol g*); Limnocharis Plumieri (*i-h, aq, fl y*); Nelumbium luteum (*c-h, aq, fl y, sc*; *fol b-g*); N. speciosum (*c-h, aq, fl w*, tipped *pi, sc*; *fol g*); Nymphæa Devoniensis (*st, aq, fl pi-r*); N. Lotus (*st, aq, fl r* or *w*) and var.; N. scutifolia (*i-h, aq, fl b, sc*); N. stellata (*st, aq, fl b, sc*) and vars.; N. Sturtevantii (*st, aq, fl pi*); N. thermalis (*st, aq, fl w, sc*); Ottelia ovalifolia (*st, aq, fl g* and *y*); Ouvirandra fenestralis (*st, aq, fl g-w*); Papyrus antiquorum (*c-h, aq*, stems and *fol*); Pistia Stratiotes (*st, aq, fol g*); Sagittaria montevidensis (*i-h, aq, fl w*, spotted *r*); Scirpus riparius (*c-h, s-aq, fl br*); Villarsia parnassifolia (*c-h, s-aq, fl y*; *fol g*); V. reniformis (*c-h, s-aq, fl g*; *fol g*).

BORDERS.—Under this heading are given lists of the most desirable herbaceous plants for the open Border. These lists are intended to assist anyone in rapidly selecting plants which are likely to give satisfaction in the general garden. After making what appears to be a suitable selection, the reader will, of course, turn to the body of the Dictionary for fuller information respecting the plants chosen. The colours of the flowers are indicated, as upon that a selection so much depends. Everyone who has a garden will therefore find this section of "Plants for Special Purposes" exceedingly useful.

Hardy.—ANNUALS.—Acroclinium roseum (*fl pi*); A. r. album (*fl w*); A. r. grandiflorum (*fl pi*); Adonis æstivalis (*fl r*); A. autumnalis (*fl r*); Agrostemma cœli-rosa (*fl pi, w*, or *p*); A. c.-r. fimbriata (*fl p*); Agrostis nebulosa (*fl*);

Borders (Hardy Annuals)—*continued.*

A. pulchella (*fl*); Amarantus caudatus (*fl p*); Anagallis grandiflora (*fl r, b*, &c.); Argemone albiflora (*fl w*); A. hirsuta (*fl w*); A. ochroleuca (*fl y*); Asperula orientalis (*fl b*); Bartonia albescens (*fl y*); B. aurea (*fl y*); Blumenbachia insignis (*fl w*); Borago longifolia (*fl b*); B. officinalis (*fl b, p*, or *w*); Calandrinia grandiflora (*fl p-r*); C. Menziesii (*fl pi*); Calendula maderensis (*fl o*); C. officinalis (*fl o*); Callistephus chinensis (*fl p*, &c.); Centaurea Cyanus (*fl p* and *b*); C. suaveolens (*fl y, sc*); Centranthus macrosiphon (*fl r* or *w*); Cerinthe major (*fl y* and *p*); C. minor (*fl y*, or spotted *br*); C. retorta (*fl y* and *v*); Chlora perfoliata (*fl y*); Chrysanthemum carinatum (*fl w, p*); C. coronarium (*fl y*); C. segetum (*fl y*); C. s. grandiflorum (*fl y*); Clarkia elegans (*fl r*); C. pulchella (*fl p*); Collinsia bicolor (*fl w* and *pi-p*); C. grandiflora (*fl p* and *b*); C. verna (*fl w* and *b*); Collomia coccinea (*fl r*); C. grandiflora (*fl r-y*); Convolvulus tricolor (*fl y, b*, and *w*); Coreopsis Drummondi (*fl y*, banded *r-br*); C. tinctoria (*fl y*, blotched *p-br*); Crepis rubra (*fl r*); Delphinium Ajacis (*fl b, r*, or *w*); D. cardinale (*fl r* and *y*); Downingia pulchella (*fl b, y* eye); Erysimum Perofskianum (*fl o-y*); Eucharidium concinnum (*fl l-p*); Fedia Cornucopiæ (*fl r*); Gaillardia amblyodon (*fl r*); Gilia achilleæfolia (*fl p-b, w*, or *r*); G. androsacea (*fl l, p*, or *w, y* or dark throat); G. capitata (*fl b*); G. densiflora (*fl l*, or nearly *w*); G. liniflora (*fl w*); G. micrantha (*fl pi*); G. m. aurea (*fl y*); G. tricolor (*fl o-y, p*, and *w*) and vars.; Glaucium phœniceum (*fl r*, spotted *bk*); Helianthus annuus (*fl* variable, usually *y*); Heliotropium convolvulaceum (*fl w, sc*); Hordeum jubatum (*fl*); Iberis coronaria (*fl w*); I. umbellata (*fl* variable, usually *p*); Impatiens amphorata (*fl p, r*, and *pi*); I. Roylei (*fl p*); Lathyrus grandiflorus (*fl pi*); L. odoratus (*fl* variable, *sc*); Limnanthes Douglasii (*fl y*, passing to *w*, streaked *gy, sc*); Linaria bipartita (*fl v-p, o*, and *w*); L. reticulata (*fl p* and *y*); L. spartea (*fl y*); Linum grandiflorum (*fl pi*); L. g. rubrum (*fl r-pi*); Loasa Pentlandii (*fl o*); L. prostrata (*fl y*); L. vulcanica (*fl w*); Lupinus luteus (*fl y, sc*); L. nanus (*fl l* and *b*); Madia elegans (*fl y*); Malcolmia maritima (*fl l, pi, r*, or *w*); Malope trifida (*fl p* or *w*); Matricaria inodora flore-pleno (*fl w*); Mimulus luteus (*fl y*); M. l. cupreus (*fl r* or *r-br*); Moricandia arvensis (*fl v*); M. sonchifolia (*fl v-b*); Nemesia cynanchifolia (*fl l-b*); N. floribunda (*fl w* and *y, sc*); Nemophila insignis (*fl b, w* eye, &c.) and vars.; N. maculata (*fl w*, blotched *v-p*); N. Menziesii (*fl w*, varying to *b*) and vars.; Nicandra physaloides (*fl b*); Nigella damascena (*fl w* or *b*); N. hispanica (*fl b, r* stamens); N. orientalis (*fl y*, spotted *g*); Nolana lanceolata (*fl b, w, g*); N. paradoxa (*fl*); N. tenella (*fl b*); Nonnea rosea (*fl pi, y-w* throat, or *b*); Œnothera amœna (*fl pi*, spotted *r*); Œ. a. rubicunda (*fl l-p*, blotched); Œ. bistorta Veitchiana (*fl y*, spotted *r*); Œ. Whitneyi (*fl pi-r, w*, &c.); Oxalis valdiviensis (*fl y*, streaked *r*); Panicum capillare (*fl*); P. miliaceum (*fl*); Papaver Hookeri (*fl pi* to *r*, blotched *w* or *b-bk*); P. Rhœas (*fl r*) and vars.; P. somniferum (*fl* variable); Phacelia campanularia (*fl b*, spotted *w*); P. viscida (*fl b, p*); P. Whitlavia (*fl b*); Podolepis aristata (*fl y*); Polygonum orientale (*fl pi-p* or *w*); Reseda odorata (*fl y-w*, &c., *sc*); Sabbatia campestris (*fl pi*); Saponaria calabrica (*fl pi*); Scabiosa atropurpurea (*fl r*) and vars.; Schizanthus pinnatus (*fl v* or *l*, and *y*, &c.) and vars.; Sedum cœruleum (*fl b*; *fol g*, spotted *r*); Silene Atocion (*fl w*); S. pendula (*fl pi*); S. p. compacta (*fl pi*); Silybum Marianum (*fl pi-p*); Statice Suworowi (*fl l*); Streptanthus maculatus (*fl p*); Tagetes erecta (*fl y*); T. patula (*fl y* or *y-br*); T. tenuifolia (*fl y*); Tropæolum majus (*fl* variable); T. minus (*fl* variable); T. peregrinum (*fl y*); Ursinia pulchra (*fl o*); Vesicaria grandiflora (*fl y*); Vicia onobrychioides (*fl p*); Wahlenbergia hederacea (*fl b*); Xeranthemum annuum (*fl p*); Zea Mays (*fl, fol*) and vars.

BIENNIALS.—Althæa caribæa (*fl pi*); Aster Bigelovii (*fl l* and *y*); Bromus brizæformis (*fl*); Campanula Medium (*fl b, p*, and *w*); C. sibirica divergens (*fl v*); Centaurea Fenzlii (*fl y*); Chlora grandiflora (*fl y*); Dianthus chi-

Borders (Hardy Biennials)—*continued.*

nensis (*fl* variable); D. c. Atkinsoni (*fl r*); Digitalis purpurea (*fl p*, varying to *w*); Echinospermum marginatum macranthum (*fl b*); Fœniculum dulce (*fol g*); Glaucium flavum (*fl y*); Grindelia grandiflora (*fl y* or *o*); Hesperis grandiflora (*fl*); Lavatera arborea variegata (*fol* variegated); Meconopsis nepalensis (*fl y*); Michauxia lævigata (*fl w*); Myosotis sylvatica (*fl b, y* throat); Œnothera biennis (*fl y, sc*); Salvia bicolor (*fl b-v*, dotted *y*, and *w*); Tragopogon glaber (*fl p*); Verbascum Chaixii (*fl y*).

Perennials.—Abronia fragrans (*fl w, sc*); Acantholimon glumaceum (*fl pi*); A. venustum (*fl pi*); Acanthus longifolius (*fl p*); A. mollis (*fl w* or *pi*); A. m. latifolius (*fl w* or *pi*); A. spinosissimus (*fl pi*); A. spinosus (*fl p*); Achillea ægyptiaca (*fl y*); A. asplenifolia (*fl pi*); A. aurea (*fl y*); A. Eupatorium (*fl y*); A. Millefolium roseum (*fl pi*); A. Ptarmica flore-pleno (*fl w*); Aconitum album (*fl w*); A. angustifolium (*fl b*); A. Anthora (*fl y*); A. A. nemorosum (*fl y*); A. barbatum (*fl c*); A. biflorum (*fl b*); A. chinense (*fl b*); A. delphinifolium (*fl b-p*); A. eminens (*fl b*); A. gracile (*fl b* or *v*); A. Halleri (*fl v*); A. H. bicolor (*fl w*, variegated *b*); A. japonicum (*fl pi*); A. lycoctonum (*fl v*); A. Napellus (*fl*); A. ochroleucum (*fl c*); A. Ottonianum (*fl b*, variegated *w*); A. paniculatum (*fl v*); A. pyrenaicum (*fl y*); A. rostratum (*fl v*); A. tauricum (*fl b*); A. uncinatum (*fl b*); A. vulparia (*fl y*); A. v. septentrionale (*fl b*); A. Willdenovii (*fl b-p*); Actinella grandiflora (*fl y*); Actinomeris helianthoides (*fl y*); A. procera (*fl y*); A. squarrosa (*fl y*); Adenophora coronopifolia (*fl b*); A. denticulata (*fl b*); A. Fischeri (*fl b* or *b-w*); A. Lamarckii (*fl b*); A. liliiflora (*fl sc*); A. pereskiæfolia (*fl b*); A. stylosa (*fl b*); A. verticillata (*fl b*); Adonis pyrenaica (*fl y*); Æthionema coridifolium (*fl pi-l*); Agrimonia odorata (*fl y*); Agrostemma coronaria (*fl w, r* centre, &c.); A. flos-Jovis (*fl p* or *r*); Aira flexuosa (*fl br*); Ajuga orientalis (*fl b*); A. pyramidalis (*fl b* or *p*); A. reptans (*fl b* to *pi*); Alchemilla alpina (*fl g*); A. sericea (*fl g*); Aletris aurea (*fl y*); A. farinosa (*fl w*); Allium acuminatum (*fl pi*); A. azureum (*fl b*); A. Bidwelliæ (*fl pi*); A. Breweri (*fl pi*); A. cœruleum (*fl b*); A. falcifolium (*fl pi*); A. Macnabianum (*fl m*); A. Moly (*fl y*); A. Murrayanum (*fl pi-p*); A. neapolitanum (*fl w*); A. nigrum (*fl v* or *w*); A. pedemontanum (*fl pi-p*); A. reticulatum attenuifolium (*fl w*); A. roseum (*fl l-pi*); A. sphærocephalum (*fl r-p* and *g*); Alströmeria aurantiaca (*fl r-y*); A. chilensis (*fl pi* or *r*, variegated *y*); A. psittacina (*fl r* and *g*, spotted *p*); A. versicolor (*fl y*, marked *p*); A. v. niveo-marginata (*fl pi, r*, and *w*, marked *g* and *bk*); Althæa cannabina (*fl pi*); A. flexuosa (*fl r*); A. narbonensis (*fl r*); A. rosea (*fl pi, w, y, r*, &c.); Alyssum alpestre (*fl y*); A. orientale (*fl* and *fol y*); Amsonia salicifolia (*fl b*); A. Tabernæmontana (*fl b*); Anemone alpina (*fl w* and *p, c, y*, &c.); A. a. sulphurea (*fl y*); A. angulosa (*fl b*); A. apennina (*fl b*); A. blanda (*fl b*); A. coronaria (*fl* various); A. decapetala (*fl c* or *y*); A. dichotoma (*fl w*, tinged *r*); A. fulgens (*fl r, bk* centre); A. Halleri (*fl p*); A. japonica (*fl r*); A. j. alba (*fl w*); A. j. elegans (*fl pi*); A. multifida (*fl r, w-y*, or *y*); A. nemorosa cærulea (*fl b*); A. n. flore-pleno (*fl w*); A. n. Robinsoniana (*fl b*); A. n. rosea (*fl pi*); A. patens (*fl p* or *y*); A. p. Nuttalliana (*fl p* or *c*); A. pratensis (*fl p*); A. Pulsatilla (*fl v*); A. rivularis (*fl w, p* anthers); A. stellata (*fl p, pi*, or *w*); A. sylvestris (*fl w*); A. vernalis (*fl w* and *v*); A. virginiana (*fl p* or *p-g*); Anemonopsis macrophylla (*fl l* and *p*); Antennaria dioica (*fl pi*); A. d. minima (*fl pi*); A. margaritacea (*fl w*); A. tomentosa (*fol*); Anthemis Aizoon (*fl w*); A. Biebersteinii (*fl y*); Anthericum Liliago (*fl w*); A. Liliastrum (*fl w*, spotted *g, sc*); A. L. major (*fl w*, spotted *g, sc*); A. ramosum (*fl w*); Antirrhinum majus (*fl* variable); Apios tuberosa (*fl br-p, sc*); Apocynum androsæmifolium (*fl r*); Aquilegia atropurpurea (*fl p* or *b-p*); A. cærulea (*fl b* and *w*, &c.); A. c. alba (*fl w*); A. c. hybrida (*fl b* and *w*); A. canadensis (*fl r* and *y*); A. chrysantha (*fl y*, tipped *r*); A. formosa (*fl r* and *y*); A. fragrans (*fl w* or *p, sc*); A. glandulosa (*fl l-b* and *w*); A. olympica (*fl b* and *w*); A. vulgaris (*fl w, b, l-p*, &c.); Arabis lucida (*fl w*); A. l. variegata

Borders (Hardy Perennials)—*continued.*

(*fol y* and *g*); A. rosea (*fl pi*); Aralia edulis (*fol g*); A. nudicaulis (*fol g*); A. racemosa (*fol g*); Arisæma ringens (*fl g* and *w*); A. triphylla (*fl g* and *p-br*); Armeria cephalotes (*fl pi* or *r*); A. plantaginea (*fl pi*); Arnebia echioides (*fl y*); Arnica Chamissonis (*fl y*); A. foliosa (*fl y*); A. scorpioides (*fl y*); Artemisia cana (*fol w*); A. vulgaris (*fol w* and variegated); Arum italicum (*fl g-y* or *w*); A. i. marmoratum (*fol y* and *g*); A. proboscideum (*fl g-p*); A. tenuifolium (*fl w*); Asclepias acuminata (*fl r* and *w*); A. amœna (*fl p*); A. Douglasii (*fl l-p*); A. incarnata (*fl r* or *p*); A. quadrifolia (*fl w, sc*); A. syriaca (*fl p, sc*); A. tuberosa (*fl o*); A. variegata (*fl w; fr r*); Ascyrum Crux-Andreæ (*fl y*); Asperula longiflora (*fl w, y*, and *r*); A. montana (*fl pi*); A. odorata (*fl w*); Aster acuminatus (*fl w*); A. æstivus (*fl b*); A. alpinus (*fl p*); A. altaicus (*fl b-p*); A. Amellus (*fl p*); A. A. bessarabicus (*fl p*); A. argenteus (*fl p*); A. caucasicus (*fl p*); A. concinnus (*fl p*); A. Douglasii (*fl p*); A. dumosus (*fl w*); A. d. albus (*fl w*); A. ericoides (*fl w*); A. floribundus (*fl p*); A. grandiflorus (*fl p*); A. hyssopifolius (*fl w*, or shaded *p*); A. lævis (*fl b*); A. longifolius (*fl w*); A. l. formosus (*fl pi*); A. multiflorus (*fl w*); A. novæ-angliæ (*fl p*); A. n.-a. rubra (*fl r-pi*); A. novæ-belgii (*fl b*); A. n.-b. amethystinus (*fl b*); A. paniculatus (*fl b*); A. pendulus (*fl w*, ultimately turning *pi*); A. peregrinus (*fl b-p*); A. pulchellus (*fl p*); A. pyrenæus (*fl l-b* and *y*); A. salsuginosus (*fl v-p*); A. sikkimensis (*fl p*); A. spectabilis (*fl b*); A. Tradescanti (*fl w*); A. versicolor (*fl w*, turning *p*); Astragalus adsurgens (*fl b-p*); A. alopecuroides (*fl y*); A. austriacus (*fl b* and *p*); A. galegiformis (*fl y*); A. glycyphyllos (*fl y*); A. hypoglottis (*fl p, b*, and *w*); A. h. alba (*fl w*); A. leucophyllus (*fl y*); A. maximus (*fl y*); A. onobrychioides (*fl p*); A. sulcatus (*fl v, w* keel tipped *br*); A. vulpinus (*fl y*); Astrantia carniolica (*fl w*; *fol g*, tinged *r*); A. helleborifolia (*fl pi*); A. major (*fl pi*); Baptisia alba (*fl w*); B. australis (*fl b*); B. exaltata (*fl b*); B. perfoliata (*fl y*); B. tinctoria (*fl y*); Bellevalia romana (*fl w*); B. syriaca (*fl w*); Bellidiastrum Michelii (*fl w*); Bellis perennis vars. (*fl w* or *r*); B. p. aucubæfolia (*fol g*, variegated *y*); Berkheya purpurea (*fl p*); Biarum tenuifolium (*fl br-p*); Boltonia asteroides (*fl pi*); B. glastifolia (*fl pi*); Brodiæa capitata (*fl v-b*); B. coccinea (*fl r*, tipped *y-g*); B. congesta (*fl b*); B. c. alba (*fl w*); B. grandiflora (*fl b-p*); B. Howellii (*fl b-p*); B. lactea (*fl w*, midribs *g*); B. multiflora (*fl b-p*); Bulbocodium vernum (*fl v-p, w* spot); Buphthalmum grandiflorum (*fl y*); B. salicifolium (*fl y*); B. speciosissimum (*fl y*); Cacalia suaveolens (*fl w*); C. tuberosa (*fl w*); Calamintha grandiflora (*fl p*); Callirhoe digitata (*fl r-p*); C. involucrata (*fl r*); C. Papaver (*fl v-r*); Calophanes oblongifolia (*fl b*); Caltha leptosepala (*fl w*); C. palustris (*fl y*) and vars.; C. radicans (*fl y*); Calystegia dahurica (*fl r-p*); C. pubescens flore-pleno (*fl pi*); C. Soldanella (*fl r, y* plaits); Camassia esculenta (*fl b* or *w*); C. e. Leichtlini (*fl c-w*); C. Fraseri (*fl b*); Campanula betonicæfolia (*fl p-b, y* base); C. bononiensis (*fl b-v* or *w*); C. carpathica (*fl b*); C. c. alba (*fl w*); C. c. pelviformis (*fl l, sc*); C. c. turbinata (*fl p*); C. collina (*fl b*); C. glomerata (*fl b-v* or *w*); C. grandis (*fl v-b* or *w*); C. isophylla (*fl l-b, gy* centre); C. lactiflora (*fl c* tinged *b*, or *b*); C. latifolia macrantha (*fl p-b*); C. nitida (*fl b* or *w*); C. nobilis (*fl r-v, w*, or *c*); C. peregrina (*fl v*); C. persicæfolia (*fl b*, varying to *w*); C. pyramidalis (*fl b* or *w*); C. rapunculoides (*fl b-v*); C. Rapunculus (*fl b* or *w*); C. rotundifolia (*fl b*); C. r. alba (*fl w*); C. r. Hostii (*fl b*); C. r. soldanellæflora (*fl b*); C. sarmatica (*fl b*); C. speciosa (*fl b, p*, or *w*); C. Trachelium (*fl b*, varying to *w*); C. Van Houttei (*fl b*); Cardamine asarifolia (*fl w*); C. pratensis (*fl p* or *w*); C. rhomboidea (*fl w*); C. r. purpurea (*fl pi-p*); C. trifolia (*fl w*); Carex riparia (*fl*); Carlina acanthifolia (*fl w*); Cedronella cordata (*fl p*); Centaurea alpina (*fl y*), C. atropurpurea (*fl p*); C. aurea (*fl y*); C. babylonica (*fl y*); C. dealbata (*fl pi*); C. macrocephala (*fl y*); C. montana (*fl b*); C. m. alba (*fl w*); C. m. rosea (*fl pi*); Centranthus ruber (*fl r* or *w*); Cerastium alpinum (*fl w*); C. Bieber-

Borders (Hardy Perennials)—*continued.*

steinii (*fol si*); C. Boissieri (*fl w*); C. tomentosum (*fol si*); Cerinthe maculata (*fl y*, spotted *p*); Chaptalia tomentosa (*fl w*); Cheiranthus Cheiri (*fl* variable, *sc*); C. Marshallii (*fl o*); Chelone Lyoni (*fl p*); C. nemorosa (*fl pi-p*); C. obliqua (*fl p*); C. o. alba (*fl w*); Chionodoxa Luciliæ (*fl b*, *w* centre, or *w*); C. nana (*fl w*, *l*); Chlorogalum pomeridianum (*fl w*, veined *p*); Chrysanthemum argenteum (*fl w*); C. sinense (*fl* variable); Chrysobactron Hookeri (*fl y*); Chrysogonum virginianum (*fl y*); Chrysopsis trichophylla (*fl y*); Cimicifuga americana (*fl w*); C. japonica (*fl w*); C. racemosa (*fl w*); Clematis aromatica (*fl v-b*, *sc*); C. recta (*fl w*, *sc*); Clintonia Andrewsiana (*fl pi*); C. uniflora (*fl w*); Cnicus acaulis (*fl p*); C. altissimus (*fl p*); C. spinosissimus (*fl y*); C. undulatus (*fl p*); Colchicum autumnale (*fl p*); C. Bivonæ (*fl w* and *p*); C. byzantinum (*fl pi*); C. luteum (*fl y*); C. Parkinsoni (*fl w*, tessellated *p*); Commelina virginica (*fl b*); Convallaria majalis (*fl w*, *sc*); Convolvulus althæoides (*fl r* or *l*); C. chinensis (*fl r-p*, marked *y*); Coreopsis auriculata (*fl y*, banded *p-br*); C. grandiflora (*fl y*); C. lanceolata (*fl y*); C. verticillata (*fl y*); Coronilla varia (*fl pi*); Corydalis bracteata (*fl y*); C. cava (*fl p*); C. c. albiflora (*fl w*); C. Kolpakowskiana (*fl pi* or *p*); C. lutea (*fl y*); C. Marschalliana (*fl y*); C. nobilis (*fl y*, tipped *g*); C. solida (*fl p*); Crambe cordifolia (*fl w*; *fol g*); Crinum capense (*fl* flushed *r*); Crocosmia aurea (*fl o-r*); Crocus aureus (*fl o*); C. biflorus (*fl w*, varying to *l*); C. Boryi (*fl c-w* and *o-y*); C. Imperati (*fl l-p*, lined *p*); C. iridiflorus (*fl p* and *l*); C. nudiflorus (*fl p* or *v*); C. speciosus (*fl l*, striped *p*); C. susianus (*fl o*, or marked *br*); C. vernus (*fl l*, *v*, *w*, or streaked *v* and *w*); C. versicolor (*fl p*, varying to *w*); Datisca cannabina (*fl y*; *fol g*); Delphinium azureum (*fl b*); D. cashmirianum (*fl b*); D. exaltatum (*fl b* or *w*); D. formosum (*fl b*); D. grandiflorum (*fl b*, varying to *w*); D. nudicaule (*fl r* and *y*); Dentaria digitata (*fl p*); D. diphylla (*fl w* and *p*); D. polyphylla (*fl c*); Dianthus arenarius (*fl w*, livid spot); D. atrorubens (*fl r*); D. barbatus (*fl* variable); D. Caryophyllus (*fl* all colours except *b*); D. cruentis (*fl r*); D. fimbriatus (*fl pi*); D. Fischeri (*fl pi*); D. fragrans (*fl w*, suffused *p*, *sc*); D. Holtzeri (*fl pi*); D. plumarius (*fl p*, *w*, &c.); D. Seguierii (*fl pi-p*); D. superbus (*fl pi*, *sc*); Dicentra chrysantha (*fl y*); D. eximia (*fl r-p*); D. formosa (*fl r*); D. spectabilis (*fl pi-r*); D. thalictrifolia (*fl y*, *r* mouth, *sc*); Dictamnus albus (*fl w* or *p*); Digitalis ambigua (*fl y*, reticulated *br*); Dodecatheon integrifolium (*fl r*); D. Meadia (*fl pi-p*, *w*, or *l*, *y* anthers); D. M. frigidum (*fl r-p*); D. M. lancifolium (*fl pi*, *y* at base); Doronicum altaicum (*fl y*); D. austriacum (*fl y*); D. caucasicum (*fl y*); D. Pardalianches (*fl y*); D. plantagineum excelsum (*fl y*); Dracocephalum altaiense (*fl b*); D. austriacum (*fl b*); D. peregrinum (*fl b*); D. Ruprechtii (*fl pi-p* or *l*); D. Ruyschianum japonicum (*fl w*, bordered *b*); D. speciosum (*fl pi-b*, spotted); Dracunculus vulgaris (*fl br*); Echinacea angustifolia (*fl pi* or *p*); E. purpurea (*fl r-p*, tipped *g*); Echinops commutatus (*fl w*); E. Ritrio (*fl b*); Epilobium Dodonæi (*fl pi*); E. hirsutum (*fl pi* or *w*); E. rosmarinifolium (*fl r*); Eremurus himalaicus (*fl w*); E. robustus (*fl* peach); E. spectabilis (*fl g-y*); Erigeron aurantiacus (*fl y*); E. glaucus (*fl p*); E. grandiflorus (*fl p* or *w*); E. speciosus (*fl v* and *y*); Eryngium alpinum (*fl b*); E. amethystinum (*fl b*); E. Bourgati (*fl b*); E. giganteum (*fl b*); Erysimum alpinum (*fl y*, *sc*); E. ochroleucum (*fl y-w*, *sc*); Erythronium americanum (*fl y*); E. dens-canis (*fl p-pi* or *w*); Eulalia japonica foliis-striatis (*fol g*, banded *c*); E. j. zebrina (*fol g*, cross-barred *y*); Ferula asparagifolia (*fl y*; *fol g*); F. communis (*fl y*; *fol g*); F. glauca (*fl y*; *fol g*); F. tingitana (*fl y*; *fol g*); Fœniculum vulgare (*fol g*); Fragaria chilensis (*fl w*; *fr pi*); F. c. grandiflora (*fl w*; *fr r*); Fritillaria armena (*fl y*); F. delphinensis (*fl p*, spotted *y*); F. græca (*fl br*, spotted, &c.); F. Hookeri (*fl l*); F. imperialis (*fl y*, varying to *r*); F. lutea (*fl y*, suffused *p*); F. macrophylla (*fl pi*); F. Meleagris (*fl* chequered *p*); F. pallidiflora (*fl y*); F. persica (*fl v-b*); F. pudica (*fl y*); F. pyrenaica (*fl p*); F. recurva (*fl r*); F. Sewerzowi (*fl p*, *g-y* within); F. tenella (*fl y*, chequered *p-br*); F. tulipifolia (*fl b*, streaked *p-br*, *p-br* within); F. verticillata Thunbergii (*fl g*, mottled *p*); Funkia ovata (*fl b-l* or *w*); F. o. marginata (*fl b-l* or *w*; *fol g*, margined *w*); F. Sieboldiana (*fl w*, tinged *l*); F. subcordata (*fl w*); Gagea lutea (*fl y*, *g* at back); Galanthus Elwesii (*fl w*, spotted *g*); G. nivalis (*fl w*, marked *g*) and vars.; G. plicatus (*fl g-w*); Galega officinalis (*fl b*); G. o. albiflora (*fl w*); G. orientalis (*fl b*); Galtonia candicans (*fl w*, *sc*); Gentiana acaulis (*fl b*, marked *y*); G. affinis (*fl b*); G. Andrewsii (*fl b*); G. asclepiadea (*fl*); G. cruciata (*fl b*, dotted *g*); G. lutea (*fl y*, veined and spotted); G. Pneumonanthe (*fl b*, *w*, &c.); G. septemfida (*fl b*); Geranium atlanticum (*fl p*, veined *r*); G. dahuricum (*fl p*); G. Endressii (*fl pi*, dark veins); G. ibericum (*fl b*); G. Lamberti (*fl l*); G. macrorhizon (*fl r* or *p*); G. maculatum (*fl l*); G. phæum (*fl bk-br*, spotted *w*); G. pratense (*fl b*); G. striatum (*fl pi*, dark stripes); G. sylvaticum (*fl p* or *b*); Geum coccineum (*fl p*); G. elatum (*fl y*); G. montanum (*fl y*); G. pyrenaicum (*fl y*); G. rivale (*fl y*); G. triflorum (*fl p*, *w*, and *p-r*); Gilia Brandegei (*fl y*); Gillenia trifoliata (*fl r*, varying to *w*); Gladiolus byzantinus (*fl r*); G. segetum (*fl pi*); Globularia vulgaris (*fl b*); Glycyrrhiza glabra (*fl b*); Gratiola aurea (*fl y*); G. officinalis (*fl w*, striated *p*); Gynerium argenteum (*fl* silky, sometimes tinted *p* or *y*); Gypsophila cerastioides (*fl w*, veined *r*); G. paniculata (*fl w*); G. Stevenii (*fl w*); Hedysarum coronarium (*fl r*); Helenium autumnale (*fl y*); Helianthus decapetalus multiflorus (*fl y*); H. orgyalis (*fl y*); H. rigidus (*fl br* and *y*); Helichrysum arenarium (*fl y*); Helleborus niger (*fl w*); H. olympicus (*fl p*); Hemerocallis Dumortieri (*fl o-y*, tinged *br*); H. flava (*fl o-y*, *sc*); H. fulva (*fl y*); H. Middendorfi (*fl y*); H. minor (*fl y*); Hesperis matronalis (*fl* variable, usually *sc*); Heuchera americana (*fl r*; *fol g*); H. hispida (*fl* veined *p*; *fol g*); H. sanguinea (*fl r*; *fol g*); Holcus lanatus albo-variegatus (*fol w*, striped *g*); Hypericum elegans (*fl y*); H. patulum (*fl y*); H. perfoliatum (*fl y*); Iberis Tenoreana (*fl p* or *w*); Incarvillea Olgæ (*fl pi*); Iris (Xiphion) alata (*fl l-p*); I. aurea (*fl y*); I. balkana (*fl l-p*); I. biflora (*fl v-p*); I. Chamæiris (*fl y*, veined *br*); I. cretensis (*fl l*); I. cristata (*fl l*); I. dichotoma (*fl l*, *w*, and *p*); I. Douglasiana (*fl l-p*); I. (Xiphion) filifolia (*fl p*, keel *y*); I. flavescens (*fl y*); I. florentina (*fl w*, *l*, *g*, and *br*); I. fœtidissima (*fl b-l*); I. fulva (*fl br*); I. germanica (*fl* variable, *sc*); I. graminea (*fl l-p*, *w*, *y*, and *b-p*, *sc*); I. Guldenstadtiana (*fl w*, *o*, and *y*); I. (Xiphion) Histrio (*fl l*, *l-p* and *y*); I. hybrida (*fl* variable); I. iberica (*fl p-b*, blotched *p*); I. i. insignis (*fl w* and *l-w*, blotched and veined *r-br*); I. lævigata (*fl p*, blotched *y*, &c.); I. lutescens, *fl y*, marked *p-br*); I. Monnieri (*fl y*, *sc*); I. neglecta (*fl l*, *w*, and *y*); I. ochroleuca (*fl w* and *o-y*); I. (Xiphion) persica (*fl y-l*, keeled *y*, *sc*); I. pumila (*fl l-p*); I. (Xiphion) reticulata (*fl v-p*, lined *y*); I. rubromarginata (*fl g*, tinged *p*); I. sambucina (*fl p* and *y*, *sc*); I. sibirica (*fl l-b* and *v*); I. squalens (*fl l-p*, *y*, and *br-y*); I tectorum (*fl l* and *w*); I. (Xiphion) tingitana (*fl l-p*); I. tuberosa (*fl g-y*); I. unguicularis (*fl l*, *y*, and *w*, *sc*); I. variegata (*fl br* and *y*); I. versicolor (*fl p*); I. (Xiphion) vulgare (*fl p*); I. (Xiphion) xiphioides (*fl l-p*, *y*, and *p*); Isopyrum thalictroides (*fl w*; *fol g*); Kniphofia aloides (*fl* coral-*r*, fading to *g-y*) and vars.; K. Burchelli (*fl r* and *y*, tipped *g*); K. Leichtlinii (*fl r* and *y*); K. Rooperi (*fl o-r*, turning *y*); Lactuca alpina (*fl p-b*); L. macrorhiza (*fl v-p*); L. tuberosa (*fl b*); Lamium maculatum (*fl p*; *fol g*, striped *w*; Lathyrus magellanicus (*fl b-p*); L. pratensis (*fl y*); L. rotundifolius (*fl pi*); L. sylvestris platyphyllus (*fl pi* or *w*); Leucoium æstivum (*fl w*, tipped *g*); L. Hernandezii (*fl w*, spotted *g*); L. vernum (*fl w*, spotted *g*, *sc*); Libertia formosa (*fl w*); Ligularia Kæmpferi aureo-maculata (*fol g*, blotched *y*, *w*, or *pi*); Lilium auratum (*fl w*, banded *y*, spotted *p*) and vars.; L. bulbiferum (*fl r*); L. canadense (*fl y* to *r*, spotted *r-p*); L. candidum (*fl w*, rarely tinged *p*); L. Catesbæi (*fl o-r*, spotted *p*); L. chalcedonicum (*fl r*, rarely *y*); L. concolor Buschianum (*fl r*,

Borders (Hardy Perennials)—*continued.*

g-y within); F. tenella (*fl y*, chequered *p-br*); F. tulipifolia (*fl b*, streaked *p-br*, *p-br* within); F. verticillata Thunbergii (*fl g*, mottled *p*); Funkia ovata (*fl b-l* or *w*); F. o. marginata (*fl b-l* or *w*; *fol g*, margined *w*); F. Sieboldiana (*fl w*, tinged *l*); F. subcordata (*fl w*); Gagea lutea (*fl y*, *g* at back); Galanthus Elwesii (*fl w*, spotted *g*); G. nivalis (*fl w*, marked *g*) and vars.; G. plicatus (*fl g-w*); Galega officinalis (*fl b*); G. o. albiflora (*fl w*); G. orientalis (*fl b*); Galtonia candicans (*fl w*, *sc*); Gentiana acaulis (*fl b*, marked *y*); G. affinis (*fl b*); G. Andrewsii (*fl b*); G. asclepiadea (*fl*); G. cruciata (*fl b*, dotted *g*); G. lutea (*fl y*, veined and spotted); G. Pneumonanthe (*fl b*, *w*, &c.); G. septemfida (*fl b*); Geranium atlanticum (*fl p*, veined *r*); G. dahuricum (*fl p*); G. Endressii (*fl pi*, dark veins); G. ibericum (*fl b*); G. Lamberti (*fl l*); G. macrorhizon (*fl r* or *p*); G. maculatum (*fl l*); G. phæum (*fl bk-br*, spotted *w*); G. pratense (*fl b*); G. striatum (*fl pi*, dark stripes); G. sylvaticum (*fl p* or *b*); Geum coccineum (*fl p*); G. elatum (*fl y*); G. montanum (*fl y*); G. pyrenaicum (*fl y*); G. rivale (*fl y*); G. triflorum (*fl p*, *w*, and *p-r*); Gilia Brandegei (*fl y*); Gillenia trifoliata (*fl r*, varying to *w*); Gladiolus byzantinus (*fl r*); G. segetum (*fl pi*); Globularia vulgaris (*fl b*); Glycyrrhiza glabra (*fl b*); Gratiola aurea (*fl y*); G. officinalis (*fl w*, striated *p*); Gynerium argenteum (*fl* silky, sometimes tinted *p* or *y*); Gypsophila cerastioides (*fl w*, veined *r*); G. paniculata (*fl w*); G. Stevenii (*fl w*); Hedysarum coronarium (*fl r*); Helenium autumnale (*fl y*); Helianthus decapetalus multiflorus (*fl y*); H. orgyalis (*fl y*); H. rigidus (*fl br* and *y*); Helichrysum arenarium (*fl y*); Helleborus niger (*fl w*); H. olympicus (*fl p*); Hemerocallis Dumortieri (*fl o-y*, tinged *br*); H. flava (*fl o-y*, *sc*); H. fulva (*fl y*); H. Middendorfi (*fl y*); H. minor (*fl y*); Hesperis matronalis (*fl* variable, usually *sc*); Heuchera americana (*fl r*; *fol g*); H. hispida (*fl* veined *p*; *fol g*); H. sanguinea (*fl r*; *fol g*); Holcus lanatus albo-variegatus (*fol w*, striped *g*); Hypericum elegans (*fl y*); H. patulum (*fl y*); H. perfoliatum (*fl y*); Iberis Tenoreana (*fl p* or *w*); Incarvillea Olgæ (*fl pi*); Iris (Xiphion) alata (*fl l-p*); I. aurea (*fl y*); I. balkana (*fl l-p*); I. biflora (*fl v-p*); I. Chamæiris (*fl y*, veined *br*); I. cretensis (*fl l*); I. cristata (*fl l*); I. dichotoma (*fl l*, *w*, and *p*); I. Douglasiana (*fl l-p*); I. (Xiphion) filifolia (*fl p*, keel *y*); I. flavescens (*fl y*); I. florentina (*fl w*, *l*, *g*, and *br*); I. fœtidissima (*fl b-l*); I. fulva (*fl br*); I. germanica (*fl* variable, *sc*); I. graminea (*fl l-p*, *w*, *y*, and *b-p*, *sc*); I. Guldenstadtiana (*fl w*, *o*, and *y*); I. (Xiphion) Histrio (*fl l*, *l-p* and *y*); I. hybrida (*fl* variable); I. iberica (*fl p-b*, blotched *p*); I. i. insignis (*fl w* and *l-w*, blotched and veined *r-br*); I. lævigata (*fl p*, blotched *y*, &c.); I. lutescens, *fl y*, marked *p-br*); I. Monnieri (*fl y*, *sc*); I. neglecta (*fl l*, *w*, and *y*); I. ochroleuca (*fl w* and *o-y*); I. (Xiphion) persica (*fl y-l*, keeled *y*, *sc*); I. pumila (*fl l-p*); I. (Xiphion) reticulata (*fl v-p*, lined *y*); I. rubromarginata (*fl g*, tinged *p*); I. sambucina (*fl p* and *y*, *sc*); I. sibirica (*fl l-b* and *v*); I. squalens (*fl l-p*, *y*, and *br-y*); I tectorum (*fl l* and *w*); I. (Xiphion) tingitana (*fl l-p*); I. tuberosa (*fl g-y*); I. unguicularis (*fl l*, *y*, and *w*, *sc*); I. variegata (*fl br* and *y*); I. versicolor (*fl p*); I. (Xiphion) vulgare (*fl p*); I. (Xiphion) xiphioides (*fl l-p*, *y*, and *p*); Isopyrum thalictroides (*fl w*; *fol g*); Kniphofia aloides (*fl* coral-*r*, fading to *g-y*) and vars.; K. Burchelli (*fl r* and *y*, tipped *g*); K. Leichtlinii (*fl r* and *y*); K. Rooperi (*fl o-r*, turning *y*); Lactuca alpina (*fl p-b*); L. macrorhiza (*fl v-p*); L. tuberosa (*fl b*); Lamium maculatum (*fl p*; *fol g*, striped *w*; Lathyrus magellanicus (*fl b-p*); L. pratensis (*fl y*); L. rotundifolius (*fl pi*); L. sylvestris platyphyllus (*fl pi* or *w*); Leucoium æstivum (*fl w*, tipped *g*); L. Hernandezii (*fl w*, spotted *g*); L. vernum (*fl w*, spotted *g*, *sc*); Libertia formosa (*fl w*); Ligularia Kæmpferi aureo-maculata (*fol g*, blotched *y*, *w*, or *pi*); Lilium auratum (*fl w*, banded *y*, spotted *p*) and vars.; L. bulbiferum (*fl r*); L. canadense (*fl y* to *r*, spotted *r-p*); L. candidum (*fl w*, rarely tinged *p*); L. Catesbæi (*fl o-r*, spotted *p*); L. chalcedonicum (*fl r*, rarely *y*); L. concolor Buschianum (*fl r*,

Borders (Hardy Perennials)—*continued.*

spotted *bk* below); L. croceum (*fl y*, tinted *r*); L. davuricum (*fl r*) and vars.; L. elegans (*fl r*, rarely spotted); L. e. armeniacum (*fl r*, spotted *y*); L. e. atrosanguineum (*fl* blotched *r*); L. e. sanguineum (*fl r* and *y*); L. Hansoni (*fl r-o*, dotted *p*); L. Krameri (*fl w*, tinged *r*, *sc*); L. Leichtlinii (*fl y*, marked *p* and *r*); L. longiflorum (*fl w*, *sc*); L. l. eximium (*fl w*); L. Martagon (*fl p-r*, spotted *p*); L. monadelphum (*fl y*, tinged *r* at base) and vars.; L. oxypetalum (*fl l-p*, dotted *p* within); L. pardalinum (*fl o-r*, variable); L. Parryi (*fl y*, spotted *br-r*, *sc*); L. philadelphicum (*fl o-r*, spotted *p* below); L. pomponium (*fl r*); L. pseudo-tigrinum (*fl r*, spotted *bk* within); L. pyrenaicum (*fl y*); L. roseum (*fl l*); L. speciosum (*fl w*, or spotted *r*); L. s. albiflorum (*fl w*); L. s. punctatum (*fl w*, spotted *r*); L. s. roseum (*fl w*, tinted *pi*); L. superbum (*fl o-r*, spotted); L. tenuifolium (*fl r*); L. tigrinum (*fl o-r*, spotted *p-bk*) and vars.; L. Washingtonianum (*fl w*, tinged *p* or *l*); Linaria dalmatica (*fl y*); L. purpurea (*fl b-p*); L. triornithophora (*fl p* and *y*); Linum narbonense (*fl b* or *w*); Lithospermum Gastoni (*fl b*); L. purpureo-cæruleum (*fl r*, at length *p*); L. prostratum (*fl b*, striped *r-v*); Lobelia syphilitica (*fl b*); Lophanthus anisatus (*fl b*); Lupinus lepidus (*fl p-b*, spotted *w*); L. leucophyllus (*fl pi*); L. nootkatensis (*fl b*, mixed *p*, *w*, or *y*); L. ornatus (*fl b*); L. perennis (*fl b*); L. polyphyllus (*fl b*); L. subcarnosus (*fl b*, blotched *y*); Lychnis chalcedonica (*fl r* or *w*); L. coronaria (*fl r*); L. diurna (*fl p-pi*); L. fulgens (*fl r*); L. f. Haageana (*fl r*, varying to *w*); L. vespertina (*fl w*, *sc*); L. Viscaria (*fl pi* or *r*); Lythrum Salicaria (*fl r-p*); Malva Alcea fastigiata (*fl r*); M. moschata (*fl pi* or *w*); Marshallia cæspitosa (*fl b-w*); Melittis Melissophyllum (*fl c-w*, spotted *pi* or *p*); Mertensia alpina (*fl b*); M. lanceolata (*fl b*); M. sibirica (*fl p-b* or *w*); M. virginica (*fl p-b*); Meum athamanticum (*fl w*); Milla biflora (*fl w* and *g*); Mimulus moschatus (*fl y*; *fol sc*); Mirabilis Jalapa (*fl w*, *y*, *r*, &c.); Monarda didyma (*fl r*); M. fistulosa (*fl p*); Morina Coulteriana (*fl y*); M. longifolia (*fl w*, changing to *r*); Muscari botryoides (*fl b*, *w* teeth) and vars.; M. comosum monstrosum (*fl b-v*); M. Elwesii (*fl b*); M. Heldreichii (*fl b*); M. moschatum (*fl p*, changing to *g-y* tinged *v*, *sc*); M. neglectum (*fl b*, *sc*); M. paradoxum (*fl b-bk*, *g* inside, *sc*); M. racemosum (*fl b*, changing to *r-p*, sometimes tipped *w*, *sc*); M. Szovitsianum (*fl b*, *sc*); Myosotis dissitiflora (*fl b*); M. palustris (*fl b*, *y* throat); Narcissus biflorus (*fl w*, crown *y*); N. Bulbocodium (*fl y*) and vars.; N. calathinus (*fl y*); N. incomparabilis (*fl y*) and vars.; N. Jonquilla (*fl y*, *sc*); N. Macleai (*fl w* and *y*); N. poeticus (*fl w*, crown edged *r*, *sc*) and vars.; N. Pseudo-Narcissus (*fl y*) and vars.; N. Tazetta (*fl w* and *y*, &c., *sc*) and vars.; N. triandrus (*fl w* or *y*, &c.) and vars.; Nierembergia rivularis (*fl w*, tinged *pi* or *y*); Nothoscordum fragrans (*fl w*, barred *l*, *sc*); Œnothera acaulis (*fl w*, fading to *r*); Œ. californica (*fl w*, varying to *pi*, *y* centre, *sc*); Œ. eximia (*fl w*); Œ. glauca (*fl y*); Œ. g. Fraseri (*fl y*); Œ. linearis (*fl y*, *sc*); Œ. missouriensis latifolia (*fl y*); Œ. pallida (*fl w*, *y* at base); Œ. speciosa (*fl w*, fading to *r*); Œ. taraxacifolia (*fl w*, fading to *r*); Ononis Natrix (*fl y*, veined *r*); Onopordon Acanthium (*fl p*); Ornithogalum narbonense (*fl w*, striped *g*); O. nutans (*fl w* and *g*); O. pyramidale (*fl w* and *g*); O. umbellatum (*fl w* and *g*); Orobus aurantius (*fl y*); O. flaccidus (*fl p*); O. pannonicus (*fl w*, *p*, &c.); O. vernus (*fl p* and *b*, veined *r*); Ourisia coccinea (*fl r*, *c* anthers); O. Pearcei (*fl r*); Oxalis tetraphylla (*fl r* or *p-v*); Pæonia albiflora (*fl w*, *pi*, &c.) and vars.; P. Emodi (*fl w*); P. officinalis (*fl r*); P. tenuifolia (*fl r*); P. Wittmanniana (*fl y-w*); P. varieties; Pancratium illyricum (*fl w*, *sc*); Panicum virgatum (*fl*); Papaver bracteatum (*fl r*); P. nudicaule (*fl y* or *w*); P. orientale (*fl r*, spotted *p*); P. pilosum (*fl r* or *o*, marked *w*); Pedicularis dolichorhiza (*fl y*); P. flammea (*fl r*); P. Sceptrum-Carolinum (*fl y*); P. verticillata (*fl pi* or *w*); Peltaria alliacea (*fl w*); Pentstemon antirrhinoides (*fl y*); P. azureus (*fl b*, *r-p* at base); P. barbatus (*fl r*) and var.;

Borders (Hardy Perennials)—*continued.*

P. breviflorus (*fl y* or *pi*); P. campanulatus (*fl pi*, *v*, &c.); P. confertus (*fl g-y*); P. deustus (*fl y*); P. diffusus (*fl p*); P. Eatoni (*fl r*); P. glaber (*fl p*, *v*, or *b*); P. gracilis (*fl l-p* or *w*); P. Hartwegi (*fl r*); P. heterophyllus (*fl pi* or *pi-p*); P. Menziesii Douglasii (*fl l-p*, *pi-r* at base); P. Murrayanus (*fl r*); P. pubescens (*fl v* or *p*, or partly *w*); P. venustus (*fl p*); Petasites fragrans (*fl w*, *sc*); P. frigida (*fl w*); Phalaris arundinacea (*fl p*); Phlomis herba-venti (*fl b-v*); Phlox amœna (*fl p*, *pi*, or *w*); P. divaricata (*fl l* or *b*); P. glaberrima (*fl r*); P. g. suffruticosa (*fl pi*); P. maculata (*fl p*, &c., *sc*); P. ovata (*fl r-p*); P. paniculata (*fl pi-p*, varying to *w*); P. pilosa (*fl pi*, *p*, *w*, &c.); P. reptans (*fl p* or *v*); P. subulata (*fl p* or *w*); Phuopsis stylosa (*fl pi*); Physalis Alkekengi (*fl w* and *r*; *fr r*); Physostegia virginiana (*fl pi* or *p*) and vars.; Phyteuma comosum (*fl p* or *b*); P. humile (*fl b*); Phytolacca decandra (*fl w*; *fr p*); Platycodon grandiflorum (*fl b*); Plumbago Larpentæ (*fl v*); Polemonium cæruleum (*fl b*; *fol* sometimes variegated); P. confertum (*fl b*); P. humile (*fl b* or *p*); P. reptans (*fl b* or *w*); Polygonatum biflorum (*fl g*); P. multiflorum (*fl w*; *fr b-bk*), and vars.; Polygonum affine (*fl pi-r*); P. amplexicaule (*fl pi-r* or *w*); P. compactum (*fl w*); P. cuspidatum (*fl c-w*); P. filiforme variegatum (*fol g* and *y*); P. sachalinense (*fl g-y*); Potentilla argyrophylla (*fl y*); P. congesta (*fl w*); P. Hopwoodiana (*fl* variegated *pi* and *y*); P. nitida (*fl pi*); P. unguiculata (*fl w*); Prenanthes purpurea (*fl p*); Primula Allionii (*fl mv*, *w* eye); P. altaica (*fl mv* or *p-r*, *y* eye); P. Auricula (*fl* variable); P. auriculata (*fl p*, *w* eye); P. calycina (*fl p*); P. capitata (*fl v-b*); P. cortusoides (*fl pi*); P. denticulata (*fl l*); P. d. cashmeriana (*fl p*, *y* eye); P. farinosa (*fl p*, *y* eye); P. floribunda (*fl y*); P. glutinosa (*fl b-p*); P. japonica (*fl* variable); P. marginata (*fl pi-v*); P. minima (*fl pi* or *w*); P. mollis (*fl r*, *pi*); P. nivalis (*fl w*); P. Parryi (*fl p*, *y* eye); P. rosea (*fl pi-r*, *y* eye); P. scotica (*fl p*, *y* eye); P. sikkimensis (*fl y*); P. spectabilis Wulfeniana (*fl pi-p*); P. Steinii (*fl p*); P. Stuartii (*fl p*); P. viscosa (*fl pi-p*, *w* eye); P. v. pedemontana (*fl pi-p*, *y-w* eye); P. vulgaris (*fl y*); Pulmonaria angustifolia (*fl pi*, at length *b*); P. saccharata (*fl pi*); Puschkinia scilloides (*fl w*, striped *b*); Pyrethrum achilleæfolium (*fl y*); P. corymbosum (*fl w*); P. parthenifolium aureum (*fol g-y*); P. roseum (*fl pi* and *y*) and vars.; P. Tchihatchewii (*fl w* and *y*); T. uliginosum (*fl w* and *y*); Ranunculus aconitifolius (*fl w*); R. amplexicaulis (*fl w*); R. anemonoides (*fl w*, tinted *p*); R. asiaticus (*fl* variable); R. a. sanguineus (*fl p*, *y*, *o*, or variegated); R. cortusæfolius (*fl y*); R. gramineus (*fl y*); R. parnassifolius (*fl w* or *p*); Rheum nobile (*fol g*, nerved *r*); R. officinale (*fol g*); Rhexia ciliosa (*fl p*); R. virginica (*fl p*); Romulea Bulbocodium (*fl y* and *v*, &c.); Rudbeckia grandiflora (*fl y* and *p*); R. maxima (*fl y*); R. pinnata (*fl y*); R. purpurea (*fl r-p*, tipped *g*); R. speciosa (*fl o* and *bk-p*); Ruscus Hypophyllum (*fr r*); Salvia asperata (*fl w*); S. discolor (*fl p* and *v-bk*); S. hians (*fl b*); S. interrupta (*fl v-p*, *w* throat); S. Roemeriana (*fl r*); S. Sclarea (*fl b-w*); Sanguinaria canadensis (*fl w*); Saponaria officinalis (*fl l* or *w*); Saussurea pulchella (*fl p*); Saxifraga Camposii (*fl w*); S. Cotyledon (*fl w*; *fol* edged *w*); S. crassifolia (*fl r*); S. diversifolia (*fl y*); S. granulata (*fl w*); S. ligulata (*fl r-w*); S. peltata (*fl w* or *pi*; *fol g*); S. Stracheyi (*fl pi*); S. umbrosa (*fl w*, marked *r*); S. virginiensis (*fl w*); Scabiosa amœna (*fl l* or *pi*); S. caucasica (*fl b*); S. Webbiana (*fl c-y*); Scilla amœna (*fl b* or *w*); S. bifolia (*fl b*, *r*, or *w*); S. hispanica (*fl b*, *w*, &c.) and vars.; S. hyacinthoides (*fl b-l*); S. nutans (*fl b*, *p*, *w*, or *pi*); S. peruviana (*fl l*, *r*, or *w*); S. pratensis (*fl b*); S. sibirica (*fl b*); Scolymus grandiflorus (*fl y*); Scopolia carniolica (*fl r*, *y* or *g* within); Scorzonera undulata (*fl p-pi*); Scutellaria orientalis (*fl y*, or *y* and *p*); Sedum acre aureum (*fol y*); S. Aizoon (*fl y*); S. album (*fl w*; *fol g* and *br*); S. brevifolium (*fl w*, ribbed *pi*; *fol pi*); S. erythrostictum (*fl g*, flushed *pi*); S. glaucum (*fl pi-w*; *fol g* and *w*); S. lydium (*fl pi*; *fol g*, tipped *r*); S. maximum (*fl w*, spotted *r*; *fol g*); S. m. hæmatodes (*fol p*);

Borders (Hardy Perennials)—*continued.*

S. pulchellum (*fl pi-p*); S. reflexum (*fl y*); S. Rhodiola (*fl y* or *r-p*); S. spectabile (*fl pi*); Sempervivum arachnoideum (*fl r*; *fol g* and *br*); S. atlanticum (*fl r*; *fol g* and *r-br*); S. Boissieri (*fl r*; *fol g*); S. calcaratum (*fl r-w*; *fol g*, tipped *r-br*); S. calcareum (*fl r*; *fol g*, tipped *r-br*); S. fimbriatum (*fl r*; *fol g* and *r*); S. Funckii (*fl r-p*; *fol g*); S. Heuffelii (*fl y*; *fol g*, tinted *r-br*); S. Lamottei (*fl pi*; *fol g*, tipped *r-br*); S. montanum (*fl p*; *fol g*); S. Pomelii (*fl pi-r*; *fol g*); S. soboliferum (*fl y*; *fol g*, tipped *r-br*); S. Wulfeni (*fl y*; *fol g*, tipped *r-br*); Senecio Doria (*fl y*); S. Doronicum (*fl y*); S. pulcher (*fl p*, disk *y*); Sida Napæa (*fl w*); Silene Elizabethæ (*fl pi*, *w*, and *p*); S. Hookeri (*fl pi*); S. maritima (*fl w*); S. pennsylvanica (*fl pi*); S. Schafta (*fl p*); S. virginica (*fl r*); Silphium laciniatum (*fl y*); Sisyrinchium grandiflorum (*fl p*, striated, or *w*); Smilacina oleracea (*fl w*, tinged *pi*); S. stellata (*fl w*); Solidago Drummondii (*fl y*); S. lanceolata (*fl y*); S. speciosa (*fl y*); Spigelia marilandica (*fl r* and *y*); Spiræa astilboides (*fl w*); S. Filipendula (*fl w* or *pi*); S. palmata (*fl r*); S. p. alba (*fl w*); S. Ulmaria (*fl w*); Stachys grandiflora (*fl pi* and *w*); S. lunata (*fl* striped); S. Maweana (*fl y-w*, blotched *p*); Statice elata (*fl b*); S. floribunda (*fl b*); S. latifolia (*fl b*); S. tatarica (*fl r*); Sternbergia lutea (*fl y*) and vars.; Stipa pennata (*fl*); Streptopus roseus (*fl p*); Stylophorum diphyllum (*fl y*); Symphytum caucasicum (*fl b*); S. officinale bohemicum (*fl r* or *r-p*); S. tuberosum (*fl y*); Tanacetum leucophyllum (*fl y*; *fol g-w*); Teucrium Chamædrys (*fl pi*, spotted *w* and *r*); Thalictrum anemonoides (*fl w* or *pi*); T. aquilegifolium (*fl w*); T. tuberosum (*fl w*); Thermopsis barbata (*fl p*); T. montana (*fl y*); Thladiantha dubia (*fl*); Tiarella cordifolia (*fl w*); Tradescantia virginica (*fl v*, *p*, or *w*); Trifolium Lupinaster (*fl p*); Trillium erectum (*fl p*); T. erythrocarpum (*fl w*, striped *p*); T. grandiflorum (*fl w*, turning *pi*); T. nivale (*fl w*); Tritonia Pottsii (*fl y*, flushed *r*); Trollius europæus (*fl y*); Tropæolum polyphyllum (*fl y*); T. speciosum (*fl r*); Tulipa australis (*fl* flushed *r*); T. Clusiana (*fl w*, *r*, and *bk*); T. Eichleri (*fl r*, marked *y* and *bk*); T. elegans (*fl r*, *y* eye); T. Gesneriana (*fl r*, *y*, &c.); T. Greigi (*fl r*, blotched *bk*); T. macrospeila (*fl r*, blotched *bk* and *y*); T. Oculus-solis (*fl r*, blotched *bk*); T. præcox (*fl r*, blotched *bk*); T. pubescens (*fl* variable, *sc*); T. retroflexa (*fl y*); T. suaveolens (*fl r* and *y*, *sc*); T. sylvestris (*fl y*, *sc*); T. varieties; Tussilago Farfara variegata (*fol g* and *c-w*); Uvularia grandiflora (*fl y*); U. sessilifolia (*fl y*); Valeriana Phu aurea (*fl w*; *fol g* and *y*); Veratrum album (*fl w* and *g*); V. nigrum (*fl bk-p*); Veronica incana (*fl b*); V. spicata (*fl b*); V. virginica (*fl w* or *b*); Vesicaria utriculata (*fl y*); Vicia argentea (*fl pi*, spotted *bk*); Vinca major (*fl b-p*); V. minor (*fl v-p*, *w*, or *b*); Viola cornuta (*fl b*); V. cucullata (*fl v-b* or *p*) and var.; V. Munbyana (*fl v* or *y*) and var.; V. odorata (*fl b*, *v*, or *r-p*, *sc*) and vars.; V. pedata (*fl b* or *w*) and vars.; V. rothomagensis (*fl b*, striped *bk*); V. suavis (*fl b* and *w*, *sc*); V. tricolor (*fl* variable) and vars.; Waldsteinia fragarioides (*fl y*); Wulfenia carinthiaca (*fl b*); Yucca angustifolia (*fl g*; *fol g* and *r-br*) and var.; Yucca filamentosa vars. (*fol g*, &c.); Y. glauca (*fl w*; *fol g*); Y. gloriosa recurvifolia (*fl w*, tinged *r*; *fol g*); Zephyranthes Atamasco (*fl w*).

Half-Hardy.—ANNUALS.—Alonsoa linifolia (*fl r*); A. Warscewiczii (*fl r*); Amarantus bicolor ruber (*fol*); A. hypochondriacus (*fl* and *fol r*); A. h. atropurpureus (*fl* and *fol p*); A. melancholicus ruber (*fol*); Ammobium alatum grandiflorum (*fl w*); Brachycome iberidifolia (*fl b* or *w*, dark centre); Browallia demissa (*fl b*, *r* or *p*); B. elata (*fl b*); B. grandiflora (*fl g-y*, and *w* or *l*); B. Jamesoni (*fl o*); Castilleja indivisa (*fl g-y*, bracts *r*); Chloris barbata (*fl*); Coix lachryma (*fr*); Datura fastuosa (*fl v*, *w* within); D. Metel (*fl w*, *sc*); Gomphrena globosa (*fl* variable); Helichrysum bracteatum (*fl* variable); H. b. niveum (*fl w*, *y*); Helipterum Humboldtianum (*fl y*); H. Manglesii (*fl pi*, *p*, and *y*); Impatiens Balsamina (*fl r*); Ipomœa hederacea (*fl b*); Lamarckia aurea (*fl*); Lopezia coronata (*fl pi-p*); Martynia fragrans (*fl r-p*, throat *y*,

Borders (Half-hardy Annuals)—*continued.*

sc); Mathiola annua (*fl* variable, *sc*); Maurandya Barclayana (*fl g* and *v-p*); Mentzelia bartonioides (*fl w-y*); M. ornata (*fl w*, *sc*); Nicotiana affinis (*fl y*, *sc*); N. longiflora (*fl w*, turning *p* or *y-g*); Pennisetum longistylum (*fl p*); Perilla ocimoides crispa (*fol p*); Petunia varieties (*fl* variable); Phlox Drummondii (*fl r*, *w*, &c., dark eye); Portulaca grandiflora (*fl y*, *p*); Ricinus communis (*fol g*) and vars.; Salpiglossis sinuata (*fl p*, *y-w*, &c.); Salvia coccinea (*fl r*) and vars.; Schizanthus candidus (*fl w*); S. Grahami (*fl l* or *pi*, and *y*); S. G. retusus (*fl pi* and *o*); Schizopetalon Walkeri (*fl w*); Senecio elegans (*fl p* and *y*); Swertia corymbosa (*fl b*, or *w* nerved *b*); S. paniculata (*fl w*, and *p* or *g*); Zaluzianskia capensis (*fl w*); Zinnia elegans (*fl* variable) and vars.

BIENNIALS.—Ammobium alatum grandiflorum (*fl w*); Anagallis fruticosa (*fl b*); Anarrhinum bellidifolium (*fl w* or *b*); Blumenbachia coronata (*fl w*); Mathiola incana (*fl p*, &c., *sc*).

PERENNIALS.—Ainsliæa Walkeræ (*fl w*, *r* anthers); Alströmeria Pelegrina (*fl w* or *y*, striped *pi*); A. pulchra (*fl p* and *y-w*, spotted *r*); Amaryllis Belladonna (*fl w* to *p*); Ambrosinia Bassii (*fl g*); Amicia Zygomeris (*fl y*, splashed *p*); Anagallis linifolia (*fl b*); A. l. Breweri (*fl r*); A. l. Eugenie (*fl b*, margined *w*); A. l. Napoleon III. (*fl r*); A. l. phœnicia (*fl r*); A. l. Wilmoreana (*fl b-p*, *y* eye); Anomatheca cruenta (*fl r*); Antholyza æthiopica (*fl r* and *g*); A. caffra (*fl r*); A. Cunonia (*fl r* and *bk*); Antirrhinum tortuosum (*fl p*); Aphyllanthes monspeliensis (*fl b*); Arctotis acaulis (*fl y* and *r*); A. arborescens (*fl w*, *pi*, and *y*); A. grandiflora (*fl o*); A. speciosa (*fl y*); Arisæma speciosa (*fl p*, *g*, and *w*); Astilbe japonica (*fl w*); A. j. variegata (*fl w*; *fol g*, variegated *y*); Babiana disticha (*fl b*, *sc*); B. plicata (*fl v-b*, *sc*); B. ringens (*fl r*); B. stricta (*fl w* and *l-b*, dark blotch); B. s. rubro-cyanea (*fl r* and *b*, *sc*); B. s. sulphurea (*fl c* or *y*, *b* anthers); B. s. villosa (*fl r*, *v-b* anthers); Begonia Evansiana (*fl pi*); Bellis rotundifolia cærulescens (*fl w* or *b*); Bessera elegans (*fl r*, or *r* and *w*, variable); Blumenbachia chuquitensis (*fl r* and *y*); Boussingaultia baselloides (*fl w*); Bravoa geminiflora (*fl o-r*); Brodiæa gracilis (*fl y*, nerved *br*); B. volubilis (*fl pi*); Calceolaria amplexicaulis (*fl y*); C. arachnoidea (*fl p*); C. Burbidgei (*fl y*); C. Fothergilli (*fl y*, spotted *r*); C. Pavonii (*fl y* and *b*); C. plantaginea (*fl y*); Calochortus albus (*fl w*, blotched); C. Benthami (*fl y*); C. cæruleus (*fl l*, marked *b*); C. elegans (*fl g-w*. *p* base); C. Gunnisoni (*fl l*, *g*, and *p*); C. lilacinus (*fl pi*); C. luteus (*fl g* and *y*); C. Nuttallii (*fl g* and *y*, marked *r* and *p*); C. pulchellus (*fl y*); C. purpureus (*fl g*, *p*, and *y*); C. splendens (*fl l*); C. venustus (*fl w* and *y*, marked *r*); Caloscordum nerinæflorum (*fl pi*); Caryopteris Mastacanthus (*fl v*); Centaurea Cineraria (*fl p*); C. ragusina (*fl y*); Chionographis japonica (*fl w*); Clianthus Dampieri (*fl r*, blotched *bk* or *p*); Cœlestina ageratoides (*fl b*); Collinsonia anisata (*fl y*); Commelina cœlestis (*fl b*); C. c. alba (*fl w*); Crinum asiaticum (*fl w*); C. Macowani (*fl g*, *w*, and *p*); Cypella Herberti (*fl y*); Dahlia varieties (*fl w*, *y*, *r*, &c.); Dianella lævis (*fl b*); Eryngium pandanifolium (*fl p*); Eucomis bicolor (*fl g*, edged *p*); E. nana (*fl br*); Ferraria Ferrariola (*fl g-br*); F. undulata (*fl g-br*); Francoa ramosa (*fl w*); F. sonchifolia (*fl pi*, often blotched); Gaillardia aristata (*fl y*, styles *r*); Gaura Lindheimeri (*fl pi-w*); Gladiolus blandus (*fl w* and *y*, marked *r*); G. brachyandrus (*fl r*); G. cardinalis (*fl r*, spotted *w*); G. Colvillei (*fl r*, marked *p*); G. C. alba (*fl w*); G. cruentus (*fl r* and *y-w*); G. cuspidatus (*fl p* and *r*, &c.); G. floribundus (*fl w*, *p*, *r*, &c.); G. Papilio (*fl p* and *y*); G. psittacinus (*fl r*, *p*, *y*, and *g*); G. purpureo-auratus (*fl y*, blotched *p*); G. varieties; Gunnera manicata (*fol g*); G. scabra (*fl r*; *fol g*); Helicodiceros crinitus (*fl p-br*); Herbertia cærulea (*fl w* and *b*); Hyacinthus varieties (*fl* variable); Iris susiana (*fl w*, tinged *l*, marked *br-bk*); Lilium cordifolium (*fl y*, *w*, *p*); L. giganteum (*fl w*, tinged *g* and *p*); L. japonicum (*fl w*, tinged *p*); Linum Macraei

Borders (Half-hardy Perennials)—*continued.*

(*fl o*); Lobelia cardinalis (*fl r*); L. fulgens (*fl r*); L. splendens (*fl r*); Morœa edulis (*fl v*, spotted *y*); M. tricuspis (*fl g-w*, spotted *p*); M. unguiculata (*fl w*, spotted *p-r*); Myosotis azorica (*fl p*, at length *b*); Neja gracilis (*fl y*); Nierembergia calycina (*fl y* and *w*); Ophiopogon Jaburan variegatus (*fl v-b*; *fr b*); O. japonicus (*fl w*); O. j. intermedius (*fl w*); Othonnopsis cheirifolia (*fl y*); Pancratium maritimum (*fl w, sc*); Petunia violacea vars. (*fl* variable); Phygelius capensis (*fl r*); Romneya Coulteri (*fl w*); Salvia patens (*fl b*); Saxifraga cortusæfolia (*fl w*); S. Fortunei (*fl w*); Schizostylis coccinea (*fl r*); Scilla chinensis (*fl pi-p*); Sisyrinchium iridifolium (*fl y-w*); Statice callicoma (*fl pi*); S. sinuata (*fl y*); Tephrosia virginiana (*fl y-w*, marked *p*); Tigridia pavonia (*fl o-y*); Tricyrtis hirta (*fl y*, dotted *p*); T. macropoda (*fl w-p*, dotted *p*); Triteleia laxa (*fl b*); T. porrifolia (*fl w-v*); T. uniflora (*fl l*); Tropæolum tricolorum (*fl o, r*, and *bk*); Urginea maritima (*fl w*, keeled *g-p*); Verbena venosa (*fl l* or b); Viola hederacea (*fl b* or *w*); V. pedunculata (*fl y*); Wachendorfia thyrsiflora (*fl y*); Zephyranthes carinata (*fl g* and *pi*); Z. rosea (*fl pi*).

CLIMBERS.—The most desirable herbaceous plants of a scandent or twining habit are here enumerated. By far the larger number of the ornamental Climbers and Twiners grown in our gardens, both outdoors and under glass, are of a shrubby nature: these are classified under the heading **Shrubs.**

Hardy.—ANNUALS.—Amphicarpæa monoica (*fl v* and *w*); Ipomœa purpurea (*fl p*); Lathyrus grandiflorus (*fl pi*); L. odoratus (*fl* variable, *sc*); Maurandya Barclayana (*fl g* and *v-p*); Tropæolum peregrinum (*fl y*).

PERENNIALS.—Apios tuberosa (*fl br-p, sc*); Calystegia dahurica (*fl pi-p*); C. pubescens flore-pleno (*fl w-pi*, changing to *pi*); C. Soldanella (*fl r* and *y*); Cardamine trifolia (*fl w*); Cedronella cordata (*fl p*); Cynanchum roseum (*fl r*); Hablitzia tamnoides (*fl g*); Humulus Lupulus (*fl g-y*); Ipomœa pandurata (*fl w* and *p*); Lathyrus magellanicus (*fl b-p*); L. roseus (*fl pi*); L. rotundifolius (*fl pi*); L. sylvestris platyphyllus (*fl pi*); Mutisia decurrens (*fl o*).

Half-hardy.—ANNUALS.—Grammatocarpus volubilis (*fl y*); Ipomœa hederacea (*fl b*); Trichosanthes anguina (*fl w*; *fr*).

BIENNIAL.—Adlumia cirrhosa (*fl pi*).

PERENNIAL.—Blumenbachia chuquitensis (*fl r* and *y*).

Tender.—ANNUALS.—Citrullus vulgaris (*st, fr*); Ipomœa Bona-nox (*st, fl w*); I. Quamoclit (*st, fl r*); Porana racemosa (*c-h, fl w*); Thunbergia alata (*st, fl y* and *p*); Trichosanthes palmata (*st, fl w*; *fr*).

PERENNIALS.—Alströmeria densiflora (*c-h, fl r*, dotted *bk*); Aristolochia Goldieana (*st, fl g, y*, and *br*); Asparagus scandens (*c-h, fol g*); Batatas bignonioides (*st, fl p*); B. Cavanillesii (*st, fl, w-r*); B. paniculata (*st, fl p*); Blumenbachia contorta (*c-h, fl o-r* and *g*); Bomarea Caldasiana (*c-h, fl o-y*); B. Carderi (*c-h, fl p*, spotted *p-br*); B. oligantha (*c-h, fl r* and *y*); B. Shuttleworthii (*c-h, fl o-r, y*, and *g*); B. Williamsii (*c-h, fl pi*); Campanea grandiflora (*st, fl w* and *r*); Campanumœa gracilis (*st, fl b*); Canavalia bonariensis (*st, fl p*); C. ensiformis (*st, fl w* and *r*); C. obtusifolia (*st, fl p*); Ceropegia elegans (*st, fl p*); C. Gardnerii (*c-h, fl w*, blotched *p*); C. Wightii (*st, fl g* and *p*); Cobœa penduliflora (*i-h, fl g*); C. scandens (*c-h, fl p*); Columnea Schiedeana (*st, fl y* and *br*); Hardenbergia Comptoniana (*c-h, fl p*); H. monophylla (*c-h, fl p*); Kennedya prostrata Marryattæ (*c-h, fl r*); K. rubicunda (*c-h, fl r*); Littonia modesta (*st, fl o*); Maurandya scandens (*c-h, fl p-v*); Momordica Charantia (*st, fl y*; *fr br* or *r*); Myrsiphyllum asparagoides (*c-h, fl g* or *w*; *fol g*); Oxypetalum cæruleum (*i-h, fl b*); Rhodochiton volubile (*c-h, fl r*); Selaginella Willdenovii (*st, fol g*); Swainsona galegifolia (*c-h, fl r*); Testudinaria elephantipes (*c-h, fl g-y*; *fol g*); Thunbergia coccinea (*st, fl r* to *o-pi*); T. fragrans (*st, fl w, sc*); T. laurifolia (*st, fl b*); Tropæolum azureum (*c-h, fl b* and *g-w*); T. Jarrattii (*c-h, fl o-r, y*, and *br*); T. Lobbianum (*c-h, fl o*); T. peregrinum (*c-h, fl y*).

COOL HOUSE.—The term "Cool House" applies equally to the Greenhouse and the Conservatory. Most of the plants are subjects which, though tender, do not require any great degree of heat to bring them to perfection; but a few hardy ones which are indispensable for Cool-house decoration, *e.g.*, Auricula and some of the Liliums, are also included. From 45deg. to 50deg. should be the maximum winter temperature of a structure suited to their requirements. In summer, artificial heat is unnecessary.

ANNUALS.—Ageratum mexicanum (*fl l-b*) and vars.; Amarantus tricolor (*fol p-r* or *r*, and *y*); Browallia demissa (*fl b, r*, or *p*); B. elata (*fl b*) and vars.; B. grandiflora (*fl w* or *l*); Drosera peltata (*fl pi*); D. rotundifolia (*fl w*); Gomphrena globosa (*fl* variable); Helipterum Manglesii (*fl y* or *p*); Impatiens flaccida (*fl p*); Martynia fragrans (*fl r, p, y* throat, *sc*); M. proboscidea (*fl v, y-w*, &c.); Maurandya Barclayana (*fl v-p* and *g*); Nicotiana acutiflora (*fl w*); N. affinis (*fl w, g* outside, *sc*); N. longiflora (*fl w*, turning *p* or *y-g*); Oxalis Barrelieri (*fl y*, spotted *o*); Phlox Drummondii (*fl r*, varying to *pi, p*, or *w*); Porana racemosa (*fl w*); Reseda odorata (*fl y-w*, &c., *sc*); Rhodochiton volubile (*fl r*); Salpiglossis sinuata (*fl p, y-w*, &c.); Salvia coccinea (*fl r*); Schizanthus candida (*fl w*); S. Grahami (*fl l* or *pi*, and *y*) and var.; S. pinnatus (*fl v* or *l, p*, and *y*); Schizopetalon Walkeri (*fl w*); Solanum Melongena (*fl b*; *fr w, y*, or *p*); S. sisymbriifolium (*fl b* or *w*; *fr r*); Waitzia aurea (*fl y*); W. nivea (*fl w*).

BIENNIALS.—Blepharis capensis (*fl b*); Convolvulus erubescens (*fl r-pi*); Echium candicans (*fl b*); Eustoma Russellianum (*fl l-p*); Humea elegans (*fl br-r, pi*, or *r*; *fol g*).

PERENNIALS.—Actinocarpus minor (*aq, fl w*); Actinotus helianthi (*fl w*); Agapanthus umbellatus (*fl b*) and vars.; A. u. variegatus (*fol w*, banded *g*); Agathæa cœlestis (*fl b*); Albuca aurea (*fl y*); A. Nelsoni (*fl w*, striped *r*); Amicia Zygomeris (*fl y* and *p*); Amorphophallus Lacourii (*fol g*, mottled *y*); A. Rivieri (*fl r* and *pi-g*; *fol g*); Amphicome arguta (*fl r*); A. Emodi (*fl pi* and *o*); Aneilema biflora (*fl b*); Anigozanthus coccineus (*fl r*); A. flavidus (*fl y-g*) and vars.; A. pulcherrimus (*fl y*); A. tyrianthinus (*fl p* and *w*); Anomatheca cruenta (*fl r*); Antholyza æthiopica (*fl r* and *g*); A. caffra (*fl r*); A. Cunonia (*fl r* and *bk*); Anthurium cordifolium (*fol g*); A. coriaceum (*fol g*); Arisæma concinna (*fl w*, and *g* or *b-p*); A. curvatum (*fl g, w*, and *br-r*); A. galeata (*fl g, w*, and *p*); A. nepenthoides (*fl y, br*, and *g*); A. speciosa (*fl p, g*, and *w*); Arthropodium neo-caledonicum (*fl w*); A. paniculatum (*fl w*); A. pendulum (*fl w*); Arum palæstinum (*fl p, bk*, and *y-w*); Arundo Donax (*fl r*; *fol g*); Asparagus decumbens (*fol g*); A. scandens (*fol g*); Astilbe japonica (*fl w*); A. j. variegata (*fol* variegated *y*); A. rubra (*fl pi*); Babiana disticha (*fl b, sc*); B. plicata (*fl v-b, sc*); B. ringens (*fl r*); B. stricta (*fl w* and *l-b*, blotched) and vars.; Bœa hygrometrica (*fl b, y* throat); Begonia Evansiana (*fl pi*; *fol g, r* beneath); B. gracilis (*fl pi*); B. natalensis (*fl pi*; *fol g*, spotted *w*); Blandfordia aurea (*fl y*); B. Cunninghamii (*fl r*); B. flammea (*fl y*) and vars.; B. grandiflora (*fl r*); B. nobilis (*fl o* and *y*); Blumenbachia contorta (*fl o-r*); Bravoa geminiflora (*fl o-r*); Brodiæa gracilis (*fl y*, nerved *br*); Brunonia australis (*fl b*); Brunsvigia Cooperi (*fl g-y*, edged *r*); B. falcata (*fl r*); B. Josephinem (*fl r*); B. multiflora (*fl r*); B. toxicaria (*fl pi*); Bulbine alooides (*fl y*); B. caulescens (*fl y*); Calliphruria Hartwegiana (*fl g-w*); C. subedentata (*fl w*); Callipsyche aurantiaca (*fl o-y*); C. eucrosioides (*fl r* and *g*); C. mirabilis (*fl g-y*); Calochortus albus (*fl w*, blotched); C. Benthami (*fl y*); C. cœruleus (*fl l*, dotted *b*); C. elegans (*fl g-w* and *p*); C. Gunnisoni (*fl l, y-g*, and *p*); C. lilacinus (*fl pi*); C. luteus (*fl g* and *y*); C. Nuttallii (*fl g* and *w*, marked *r* and *p*); C. pulchellus (*fl y*); C. purpureus (*fl g, p*, and *y*); C. splendens (*fl l*); C. venustus (*fl w* and *r*) and vars.; Calotis cuneifolia (*fl b*); Carpolysa spiralis (*fl w* and *r*); Centropogon fastuosus (*fl pi*); Cephalotus folli-

Cool House (Perennials)—*continued.*

cularis (*fol g, p,* and *r-pi*); Ceropegia Barklyi (*fl pi*); C. Gardnerii (*fl c-w,* blotched *p*); C. Sandersoni (*fl g*); Chænostoma polyantha (*fl l* and *y*); Chironia floribunda (*fl pi*); C. jasminoides (*fl r* or *p*); C. linoides (*fl r*); Cineraria cruenta vars. (*fl*); Clianthus Dampieri (*fl r,* blotched *bk* or *p*); Clivia nobilis (*fl r* and *y*); Cobæa penduliflora (*fl g*); C. scandens (*fl p*) and var.; Coleus varieties (*fol* variegated); Colocasia esculenta (*fl w*; *fol g*); Commelina elliptica (*fl w*); Convolvulus mauritanicus (*fl b, w* throat); C. ocellatus (*fl w, r-p* eye); Crinum asiaticum (*fl w,* tube *g*); C. Macowani (*fl w* tinged *p,* and *g*); C. Moorei (*fl w,* flushed *r*); Cyanella odoratissima (*fl pi, sc*); Cyclamen africanum (*fl w* or tinted *r,* spotted *p*); C. cilicicum (*fl w,* blotched *p*); C. Coum (*fl r*) and vars.; C. ibericum (*fl r,* spotted *p*; *fol* zoned *w*) and vars.; C. neapolitanum (*fl w* or *r,* spotted *v-p*); C. persicum (*fl w,* blotched *p*) and vars.; Cyperus alternifolius (*fol g*); C. a. variegatus (*fol w,* or *g* variegated *w*); Dahlia imperialis (*fl w, l,* and *r*); D. Juarezii (*fl r*); Darlingtonia californica (*fl w* or *g*); Decabelone Barklyi (*fl y-w,* spotted *r*); Dianella lævis (*fl b*); D. tasmanica (*fl b*; *fr b*); Dianthus Caryophyllus varieties (*fl*); Dionæa muscipula (*s-aq, fl w*; *fol*); Drimiopsis Kirkii (*fl w*); Drosera binata (*fl w*); D. filiformis (*fl p*); D. spathulata (*fl p*); Dyckia argentea (*fol w*-scaly); Elisena longipetala (*fl w*); Equisetum sylvaticum (*fol g*); Eulalia japonica foliis-striatis (*fol g,* banded *c*); E. j. zebrina (*fol g,* barred *y*); Falkia repens (*fl r*); Fragaria indica (*fl g-y*; *fr r*); Freesia Leichtlinii (*fl y* or *c, sc*); F. refracta (*fl w* or lined *v,* blotched *o, sc*); Galanthus Elwesii (*fl w,* spotted *g*); G. nivalis (*fl w,* marked *g*) and vars.; G. plicatus (*fl g-w*); Galaxia ovata (*fl y*); Geissorhiza grandis (*fl y* and *r*); G. inflexa (*fl y,* spotted *p*); G. Rochensis (*fl b,* spotted *r*); Gladiolus blandus (*fl w* and *y,* marked *r*); G. brachyandrus (*fl r*); G. cardinalis (*fl r,* spotted *w*); G. Colvillei (*fl r,* marked *p*); G. C. alba (*fl w*); G. cruentus (*fl r* and *y-w*); G. cuspidatus (*fl p* and *r,* &c.); G. floribundus (*fl w, p, r,* &c.); G. Papilio (*fl p* and *y*); G. psittacinus (*fl r, p, y,* and *g*); G. purpureo-auratus (*fl y,* blotched *p*); G. varieties; Gynura aurantiaca (*fl o*; *fol g, v*-hairy); Hæmanthus natalensis (*fl g* and *o*); Hechtea argentea (*fl w*; *fol si*); Hedychium flavum (*fl o, sc*); H. Gardnerianum (*fl g-y, sc*); Hesperantha radiata (*fl w,* tinged *r-br*); Hessea crispa (*fl pi*); Hibiscus coccineus (*fl r*); Hippeastrum aulicum (*fl r, g,* and *r-p*); H. pardinum (*fl c,* dotted *r*); H. vittata (*fl w,* striped *r*); H. hybrids; Houttuynia cordata (*fl w*; *fol g*); Hyacinthus amethystinus (*fl b*); H. corymbosus (*fl l-pi*); H. orientalis (*fl* variable, *sc*); H. o. albulus (*fl w, sc*); H. varieties; Hymenocallis calathinum (*fl w, sc*); Hypoxis stellata (*fl w* and *b*); Imantophyllum Gardeni (*fl r-o* or *y*); I. miniatum (*fl o* and buff); I. hybrids; Ixia capillaris (*fl pi* or *l*); I. hybrida (*fl w*); I. maculata (*fl o*); I. odorata (*fl y, sc*); I. patens (*fl pi*); I. speciosa (*fl r*); I. viridiflora (*fl g,* spotted) and vars.; Kennedya prostrata (*fl r*) and vars.; K. rubicunda (*fl r*); Lachenalia fragrans (*fl y, sc*); L. lilacina (*fl l* and *b*); L. Nelsoni (*fl y*); L. pendula (*fl p, r,* and *y*); L. purpureo-cærulea (*fl p-b*); L. tricolor (*fl g, r,* and *y*); L. t. lutea (*fl y*); Lilium auratum (*fl w,* banded *y,* spotted *p*) and vars.; L. elegans (*fl r*) and vars.; L. giganteum (*fl w,* tinged *g* and *p*); L. japonicum (*fl w,* tinged *p*); L. longiflorum (*fl w, sc*) and var.; L. neilgherrense (*fl w, sc*); L. speciosum (*fl w* and *r*) and vars.; Lobelia Erinus (*fl b, w* or *y* throat) and vars.; L. fulgens (*fl r*); Lotus australis (*fl w,* varying to *p-r*); L. gebelia (*fl r,* turning *pi*); L. jacobæus (*fl bk-p* and *y*); Lycoris aurea (*fl y*); L. Sewerzowi (*fl br-r, sc*); Lythrum Græfferi (*fl pi*); Manulea rubra (*fl y*); Marica lutea (*fl y, r,* and *w*); Maurandya Barclayana (*fl g* and *v-p*); Mimulus moschatus (*fl y*; *fol sc*); Mirabilis Jalapa (*fl w, y, r,* &c.); Moltkia petræa (*fl v-p*); Moræa edulis (*fl v,* spotted *y*); M. tricuspis (*fl g-w,* spotted *w*); M. unguiculata (*fl w,* spotted *p-r*); Musschia aurea (*fl y*); Myrsiphyllum asparagoides (*fl g* or *w*; *fol g*);

Cool House (Perennials)—*continued.*

Narcissus biflorus (*fl w, y* crown); N. Bulbocodium (*fl y*) and vars.; N. calathinus (*fl y*); N. incomparabilis (*fl y*) and vars.; N. Jonquilla (*fl y, sc*); N. Macleai (*fl w* and *y*); N. poeticus (*fl w,* crown edged *r, sc*) and vars.; N. Pseudo-Narcissus (*fl y*) and vars.; N. Tazetta (*fl w* and *y,* &c., *sc*) and vars.; N. triandrus (*fl w* or *y,* &c.) and vars.; Nelumbium luteum (*aq, fl y, sc*; *fol b-g*); N. speciosum (*aq, fl w,* tipped *pi, sc*; *fol g*); Nemastylis acuta (*fl b, y,* and *bk*); Nerine curvifolia (*fl r*); N. flexuosa (*fl r,* tinged *o*) and vars.; N. sarniensis (*fl pi*) and vars.; N. undulata (*fl w-pi*); Nicotiana suaveolens (*fl w, sc*); Nierembergia filicaulis (*fl l, y* centre); Nolina georgiana (*fl w*); Ornithogalum arabicum (*fl w, bk* eye, *sc*); O. thyrsoides (*fl y*) and vars.; Oxalis Bowiei (*fl pi, y* at base); O. elegans (*fl p*); O. hirta (*fl v* or *r*) and vars.; O. lasiandra (*fl r*; *fol g,* spotted *p*); O. Martiana (*fl pi*); O. rosea (*fl pi*); O. variabilis (*fl w* or *r*) and vars.; O. versicolor (*fl w, y* outside); Pancratium maritimum (*fl w, sc*); Pelargonium Bowkeri (*fl p* and *y*); P. Endlicherianum (*fl pi,* nerved *p*); P. fissum (*fl pi*); P. pulchellum (*fl w,* spotted *r*); Perilla ocimoides crispa (*fl w*; *fol p*); Petunia varieties (*fl* variable); Phædranassa rubro-viridis (*fl r* and *g*); Phormium Cookianum (*fl y,* or *y* and *g*; *fol g*); P. C. variegatum (*fol g* and *c-w*); P. tenax (*fl y* or *r*; *fol g,* margined *r-br*) and vars.; Phyllostachys nigra (*fol g*; *stems*); Physalis peruviana violacea (*fl y,* spotted *p*; *fr v*); Pinguicula caudata (*fl r*; *fol g,* margined *p*); Podolepis gracilis (*fl p, l,* or *w*); Polianthes tuberosa (*fl w, sc*) and vars.; Prepusa Hookeriana (*fl y-w*); Primula Auricula (*fl* variable, *sc*); P. Boveana (*fl y*); P. cortusoides Sieboldii (*fl pi, w* eye); P. floribunda (*fl y*); P. mollis (*fl pi* and *r*); P. obconica (*fl l* or *p*); P. sinensis (*fl w* or *l*); P. verticillata sinensis (*fl y*); Pterodiscus speciosus (*fl l* or *r*); Ranunculus Lyalli (*fl w*); Richardia africana (*s-aq, fl w,* spadix *y*); R. albo-maculata (*s-aq, fl g-w*); R. melanoleuca (*s-aq, fl y* and *bk-p,* spadix *w*); Romneya Coulteri (*fl w*); Romulea speciosa (*fl pi, y,* and *v*); Salvia cacaliæfolia (*fl b*); S. coccinea (*fl r*); S. gesneræflora (*fl r*); S. ianthina (*fl v-p*); Sandersonia aurantiaca (*fl o*); Sarracenia chelsoni (*fol r*); S. Courtii (*fol r-p*); S. Drummondii (*fl p*; *fol g, w,* and *p*) and vars.; S. flava (*fl y*; *fol y, r,* and *p*) and vars.; S. formosa (*fol g* and *r*); S. Mitchelliana (*fol g* veined *r,* turning *r*); S. psittacina (*fl p*; *fol g, p,* and *w*); S. purpurea (*fl p*; *fol g,* veined *p*); S. rubra (*fl r-p*; *fol g,* veined *p*); S. Williamsi (*fol g,* veined *p-r*); Schizostylis coccinea (*fl r*); Senecio speciosus (*fl p*); Solanum sisymbriifolium (*fl b* or *w*; *fr r*); Sparaxis grandiflora (*fl p, w,* or variegated); S. pendula (*fl l*); S. tricolor (*fl o, y,* and *bk*); S. varieties; Sprekelia formosissima (*fl r* or *w*); Stachys coccinea (*fl r*); Stenomesson coccineum (*fl r*); S. incarnata (*fl r,* &c.); Streptanthera elegans (*fl w, pi, p,* and *y*); Streptocarpus Dunnii (*fl pi,* tinged *r*); S. parviflora (*fl w,* streaked *p*); Stylidium bulbiferum macrocarpum (*fl g-p*); S. graminifolium (*fl pi*); S. spathulatum (*fl y*); Swainsona galegifolia (*fl r*); S. Greyana (*fl pi*); Synnotia variegata (*fl y* and *v*); Theropogon pallidus (*fl w* or tinged *r*); Thysanotus junceus (*fl p*); T. multiflorus prolifer (*fl p*); T. tuberosus (*fl p*); Tigridia atrata (*fl p, g,* and *br*); T. Meleagris (*fl p,* banded *r*); T. Van Houttei (*fl y, l,* and *p*); Trichonium Manglesii (*fl pi* and *w*); Tricyrtis hirta (*fl w,* dotted *p*; T. macropoda (*fl w-p,* dotted *p*); Tritonia crocata (*fl y*); T. crocosmiflora (*fl o-r*); T. miniata (*fl r*); Tropæolum azureum (*fl b, g-w* claw); T. Jarrattii; (*fl o-r* and *y*); T. Lobbianum (*fl o*); T. peregrinum (*fl y*); T. tricolorum (*fl o-r, o,* and *bk*); Utricularia bifida (*fl y*); Vallota purpurea (*fl r*) and vars.; Villarsia parnassifolia (*s-aq, fl y*); V. reniformis (*s-aq, fl y*); Wahlenbergia saxicola (*fl l*); W. tuberosa (*fl w,* banded *pi-r*); Watsonia densiflora (*fl pi-r*); W. Meriana (*fl p* or *r*); W. rosea (*fl pi*); Wigandia macrophylla (*fl l*; *fol g*); W. Vigieri (*fl l-b,* varying to *r*; *fol g*); Xanthorrhœa Preissii (*fl w*); Xanthosia rotundifolia (*fl w*); Yucca flexilis ensifolia (*fl w,* tinged *r*; *fol g*); Zephyranthes Andersoni (*fl y* or *y-br*; Z. candica (*fl w*).

INTERMEDIATE HOUSE.—Plants which require a higher temperature than is usually maintained in the ordinary cool or green-house, but yet need less heat and humidity than stove subjects, are here classified. The following may be taken as the average temperatures of an Intermediate or Warm House: Winter, day, 55deg. to 65deg; night, 50deg. to 55deg. In summer no fire heat is required.

ANNUALS.—Begonia humilis (*fl w*); Celosia argentea (*fl w*); C. cristata (*fl r*) and vars.; C. c. variegata (*fl r; fol* variegated); C. Huttonii (*fl r; fol r*); C. pyramidalis (*fl* variable); Thunbergia alata (*fl y* and *p*) and vars.

PERENNIALS.—Achimenes grandiflora (*fl v-p*); A. Kleei (*fl l, y* mark); A. multiflora (*fl l*); A. ocellata (*fl r-y*, dark spots); A. pedunculata (*fl r, y* eye); A. picta (*fl r, y* eye); A. varieties; Amorphophallus campanulatus (*fl br, r,* and *bk; fol g*); Barbacenia purpurea (*fl p, sc*); B. Rogieri (*fl p, sc*); Batatas bignonioides (*fl p*); B. Cavanillesii (*fl w-r*); B. edulis (*fl w* and *p*); B. paniculata (*fl p*); Begonia acutiloba (*fl w*); B. amabilis (*fl pi* or *w; fol g* or variegated); B. amœna (*fl pi*); B. Berkeleyi (*fl pi*); B. boliviensis (*fl r*); B. Bruantii (*fl w* or *pi; fol g,* tinted *br*); B. Chelsoni (*fl o-r*); B. Clarkii (*fl r*); B. coriacea (*fl pi*); B. Davisii (*fl r; fol g, r* beneath); B. Dregii (*fl w; fol g, w,* and *r*); B. echinosepala (*fl w*); B. eximia (*fol p* and *r*); B. geranifolia (*fl r* and *w; fol g,* margined *r*); B. geranioides (*fl w; fol g*); B. glandulosa (*fl g-w; fol g*); B. herbacea (*fl w*); B. hydrocotylifolia (*fl pi*); B. imperialis (*fol* olive-*g,* banded *gy-g*); B. laciniata (*fl w,* tinted *pi; fol g*); B. malabarica (*fl pi; fol g,* spotted *w*); B. maxima (*fl w*); B. monoptera (*fl w; fol g, r* beneath); B. nelumbiifolia (*fol g*); B. octopetala (*fol g*); B. Pearcei (*fl y; fol g, r* beneath); B. picta (*fl pi; fol* sometimes variegated); B. pruinata (*fl w*); B. ricinifolia (*fol* bronzy *g*); B. rubricaulis (*fl w* and *pi; fol g*); B. rubro-venia (*fl w,* veined *pi-r; fol g, w,* and *p-br*); B. scandens (*fl w; fol g*); B. Schmidtiana (*fl w; fol g,* tinged *r* beneath); B. semperflorens (*fl w* or *pi; fol g*) and vars.; B. stigmosa (*fl w; fol g* and *br-p*); B. strigillosa (*fl pi; fol g,* margined *r*); B. Sutherlandi (*fl o-r; fol g,* nerved *r*); B. Veitchii (*fl r; fol g*); B. Verschaffeltiana (*fl pi*); B. xanthina (*fl y; fol g, p* beneath) and vars.; Canna Achiras variegata (*fl r; fol g,* striped *w* and *y*); C. Annæi (*fl pi*) and vars.; C. Auguste Ferrier (*fl o-r; fol g,* margined *p-r*); C. Bihorelli (*fl r; fol* bronzy); C. Depute Henon (*fl y*); C. discolor (*fl r; fol g* and *r*); C. expansa-rubra (*fl p; fol r*); C. gigantea (*fl o-r* and *p*); C. indica (*fl r* and *y*); C. limbata (*fl y-r*); C. nigricans (*fol r*); C. Rendatleri (*fl pi-r; fol g,* tinged *r*); C. speciosa (*fl r*); C. Van Houttei (*fl r; fol g,* margined *p-r*); C. Warscewiczii (*fl r* and *p; fol g,* tinged *p*); C. zebrina (*fl o; fol g* and *r*); Coleus varieties (*fol* variable); Eurycles Cunninghami (*fl w*); Griffinia Blumenavia (*fl w,* streaked *pi*); G. dryades (*fl p-l* and *w*); G. hyacinthina (*fl b* and *w*); G. ornata (*fl b-l* and *w*); Hippeastrum Ackermanni (*fl r*) and vars.; H. equestre (*fl o-g*) and vars.; H. reticulatum (*fl pi* and *w,* netted); H. hybrids (*fl*); Iresine Herbstii (*fol r*); I. H. aureo-reticulata (*fol g,* blotched *y*); I. Lindenii (*fol r,* banded *p*); Limnocharis Plumieri (*aq, fl y*); Littonia modesta (*fl o*); Nymphæa scutifolia (*aq, fl b, sc*); Oplismenus hirtellus (*fl*); Pellionia Daveauana (*fol g,* tinted *v*); P. pulchra (*fol g* and *bk, p* beneath); Phædranassa Carmioli (*fl r,* tipped *g*); P. eucrosioides (*fl g* and *r*); P. Lehmanni (*fl r*); Sagittaria montevidensis (*aq, fl w,* spotted *r*); Stenomesson vitellinum (*fl y*); Strelitzia augusta (*fl w*); S. Reginæ (*fl o* and *p*); Streptocarpus Rexii (*fl b*); S. Saundersii (*fl b; fol y-g, pi-p* beneath); Vinca rosea (*fl w, p* eye, or *w* or *pi*); Zebrina pendula (*fol g* or variegated); Zephyranthes citrina (*fl y*).

ROCKERIES.—For the accommodation of hardy and half-hardy alpine and other herbaceous plants a Rockery is generally constructed in gardens of any extent. All the best annuals, biennials, and perennials that are suitable for the Rock Garden are here enumerated. Dwarf-growing evergreen shrubs and some of the Yuccas may

Rockeries—*continued.*

be successfully associated with them, in order to improve the appearance of the Rock Garden in winter, when most of the herbaceous subjects have died down. For instructions as to arranging and planting a Rockery, *see* the article on **Garden** in Vol. II.

Hardy.—ANNUALS.—Æthionema saxatilis (*fl p*); Anagallis grandiflora (*fl r, b,* &c.); Androsace coronopifolia (*fl w*); Asperula orientalis (*fl b, sc*); Ballium bellidioides (*fl w*); Bivonæa lutea (*fl y*); Briza maxima (*fl*); B. minor (*fl*); Campanula Erinus (*fl b-pi* or *w*); Centranthus Calcitrapa (*fl w,* tinged *r*); C. macrosiphon (*fl r*); Delphinium cardinale (*fl r* and *y*); Helianthemum guttatum (*fl y,* spotted *r*); Hutchinsia petræa (*fol g*); Ionopsidium acaule (*fl l,* or *w* tinged *v*); Lupinus nanus (*fl l* and *b*); Malcolmia maritima (*fl l, pi, r,* or *w*); Œnothera Whitneyi (*fl pi-r, w,* &c.); Oxalis valdiviensis (*fl y,* streaked *r*); Sedum cœruleum (*fl b; fol g,* spotted *r*); S. glandulosum (*fl r-p*); S. sempervivoides (*fl r*); Silene Atocion (*fl pi*); S. pendula (*fl pi*); S. p. compacta (*fl pi*); Statice Suworowii (*fl l*); Wahlenbergia hederacea (*fl b*).

BIENNIALS. — Bromus brizæformis (*fl*); Campanula thyrsoidea (*fl y*); Celsia cretica (*fl y* spotted); Hesperis tristis (*fl w, c, br-r,* or *p, sc*).

PERENNIALS. — Abronia fragrans (*fl w, sc*); Acæna microphylla (*fol g*); A. millefolia (*fol g*); A. myriophylla (*fol g*); A. pulchella (*fol* bronze); Acantholimon glumaceum (*fl pi*); A. venustum (*fl pi*); Achillea Ageratum (*fl w*); A. atrata (*fl w*); A. Clavennæ (*fl w*); A. Herba-rota (*fl w*); A. moschata (*fl w*); A. nana (*fl w*); A. pectinata (*fl w*); A. serrata (*fl w*); A. tomentosa (*fl y*); A. umbellata (*fl y*); Aciphylla Colensoi (*fl w*); A. squarrosa (*fl w*); Acis autumnalis (*fl w*); A. grandiflorus (*fl w*); A. roseus (*fl pi*); A. trichophyllus (*fl w*); Aconitum Anthora (*fl y*); A. biflorum (*fl b*); A. delphinifolium (*fl b-p*); A. Ottonianum (*fl b-w*); A. paniculatum (*fl v*); A. pyrenaicum (*fl y*); A. rostratum (*fl v*); Adenophora periplocæfolia (*fl b*); Adonis pyrenaica (*fl y*); A. vernalis (*fl y*); Æthionema coridifolium (*fl pi-l*); Æ. grandiflorum (*fl pi*); Ajuga genevensis (*fl b, pi,* or *w*); Alchemilla alpina (*fol g*); A. sericea (*fol g, w* beneath); Alyssum alpestre (*fl y*); A. orientale (*fl* and *fol y*); Androsace carnea (*fl pi, y* eye); A. c. eximia (*fl r, y* eye); A. Chamæjasme (*fl pi, y* eye); A. lactea (*fl w*); A. Laggeri (*fl pi*); A. lanuginosa (*fl pi, y* eye); A. sarmentosa (*fl pi, w* eye); A. villosa (*fl pi, sc*); A. Vitaliana (*fl y*); A. Wulfeniana (*fl pi* or *r*); Anemone alpina (*fl w* and *p, c, y,* &c.); A. a. sulphurea (*fl y*); A. angulosa (*fl b*); A. apennina (*fl b*); A. baldensis (*fl w,* or *r* tinged *b*); A. blanda (*fl b*); A. fulgens (*fl r, bk* centre); A. Halleri (*fl p*); A. japonica (*fl r*); A. j. alba (*fl w*); A. j elegans (*fl pi*); A. multifida (*fl r, w-y,* or *y*); A. narcissiflora (*fl c*); A. nemorosa (*fl b*); A. n. flore-pleno (*fl w*); A. n. Robinsoniana (*fl b*); A. n. rosea (*fl pi*); A. palmata (*fl y*); A. pratensis (*fl p*); A. Pulsatilla (*fl v*); A. stellata (*fl p, pi,* or *w*); Antennaria dioica (*fl pi*); A. d. minima (*fl pi*); A. tomentosa (*fol*); Anthemis Aizoon (*fl w*); Anthyllis erinacea (*fl b-p*); A. montana (*fl pi* or *p*); A. Vulneraria (*fl y, w, r,* or *p*); Aquilegia alpina (*fl b,* or *b* and *w*); A. Bertoloni (*fl b-v*); A. cærulea (*fl b* and *w,* &c.); A. c. alba (*fl w*); A. c. hybrida (*fl b* and *w*); A. canadensis (*fl r* and *y*); A. glandulosa (*fl l-b* and *w*); A. pyrenaica (*fl l-b*); A. sibirica (*fl l,* or *l* and *w*); Arabis albida (*fl w*); A. a variegata (*fol*); A. alpina (*fl w*); A. arenosa (*fl pi, w,* or *b*); A. lucida (*fl w*); A. l. variegata (*fol y* and *g*); A. petræa (*fl w*); A. rosea (*fl pi*); Arenaria balearica (*fl w*); A. graminifolia (*fl w*); A. grandiflora (*fl w*); A. laricifolia (*fl w*); A. purpurascens (*fl p*); A. rotundifolia (*fl w*); Armeria cephalotes (*fl pi* or *r*); A. dianthoides (*fl pi*); A. juncea (*fl pi*); A. juniperifolia (*fl pi*); A. plantaginea (*fl pi*); A. setacea (*fl pi*); A. vulgaris (*fl pi, r, l,* or *w*); Arnebia echioides (*fl y*); Arnica montana (*fl y*); Artemisia alpina (*fl w*); A. argentea (*fl y*); A. Mutellina (*fol w*); A. Stelleriana (*fol w*); Asarum canadense (*fl br*); A. caudatum (*fl br-r*); A. europæum (*fl br*); Asperula longiflora

Rockeries (Hardy Perennials)—*continued.*

(*fl w, y,* and *r*); A. montana (*fl pi*); A. odorata (*fl w*); Aster Amellus (*fl p*); A. peregrinus (*fl b-p*); A. pyrenæus (*fl l-b* and *y*); A. Reevesi (*fl w, y* centre); Astragalus adsurgens (*fl b-p*); A. arenarius (*fl b*); A. austriacus (*fl b* and *p*); A. hypoglottis (*fl p, b,* and *w*); A. h. alba (*fl w*); A. onobrychioides (*fl pi*); A. pannosus (*fl pi*); A. vimineus (*fl, p-pi* and *w*); Aubrietia deltoidea (*fl p*); A. d. Bougainvillei (*fl v-p*); A. d. Campbelli (*fl v-b*); A. d. Eyrei (*fl v-p*); A. d. græca (*fl p*); A d. purpurea (*fl p*); A. d. violacea (*fl v-p*); Briza media (*fl*); Callirora lutea (*fl p-b*); Campanula Allionii (*fl b* or *w*); C. alpina (*fl b*); C. barbata (*fl b* or *w*); C. cæspitosa (*fl b* or *w*); C. carpathica (*fl b*); C. c. alba (*fl w*); C. c. pelviformis (*fl l, sc*); C. c. turbinata (*fl p*); C. cenisia (*fl b*); C. Elatines (*fl b-p*); C. fragilis (*fl l-p, w* centre); C. garganica (*fl b*); C. glomerata pusilla (*fl b-v* or *w*); C. isophylla (*fl l-b, gy* centre); C. i. alba (*fl w*); C. Portenschlagiana (*fl b-p*); C. pulla (*fl v-b*); C. pusilla (*fl b,* varying to *w*); C. Raineri (*fl b*); C. rotundifolia (*fl b*); C. r. alba (*fl w*); C. r. Hostii (*fl b*); C. r. soldanellæflora (*fl b*); C. Scheuchzeri (*fl b*); C. Tommasiniana (*fl b*); C. Waldsteiniana (*fl v-b*); C. Zoysii (*fl b*); Cedronella cordata (*fl p*); Centranthus ruber (*fl r* or *w*); Cerastium alpinum (*fl w*); C. Biebersteinii (*fol si*); C. Boissieri (*fl w*); C. tomentosum (*fol si*); Chaptalia tomentosa (*fl w*); Chionodoxa Luciliæ (*fl b, w* centre, or *w*); C. nana (*fl w, l*); Claytonia sibirica (*fl pi*); C. virginica (*fl w*); Colchicum autumnale (*fl p*); C. byzantinum (*fl pi*); Coris monspeliensis (*fl l,* anthers *o*); Coronilla iberica (*fl y*); Corydalis bracteata (*fl y*); C. cava (*fl p*); C. c. albiflora (*fl w*); C. Kolpakowskiana (*fl pi* or *p*); C. lutea (*fl y*); C. Marschalliana (*fl y*); C. nobilis (*fl y,* tipped *g*); C. solida (*fl p*); Crocus aureus (*fl o*); C. biflorus (*fl w,* varying to *l*); C. Boryi (*fl c-w* and *o-y*); C. Imperati (*fl l-p,* lined *p*); C. iridiflorus (*fl p* and *l*); C. nudiflorus (*fl p* or *v*); C. speciosus (*fl l,* striped *p*); C. susianus (*fl o,* or marked *br*); C. vernus (*fl l, v, w,* or streaked *w* and *v*); C. versicolor (*fl p,* varying to *w*); Cyananthus incanus (*fl b*); C. lobatus (*fl p-b*); Dianthus alpestris (*fl r*); D. alpinus (*fl pi*); D. cæsius (*fl pi, sc*); D. cruentus (*fl r*); D. fragrans (*fl w,* suffused *p, sc*); D. glacialis (*fl r-p*); D. monspessulanus (*fl r*); D. neglectus (*fl pi*); D. petræus (*fl pi*); Diapensia lapponica (*fl w*); Dicentra formosa (*fl r*); Dictamnus albus (*fl w* or *p*); Diotis maritima (*fl y; fol* woolly); Dodecatheon integrifolium (*fl r*); D. Meadia (*fl pi-p, w,* or *l,* anthers *y*); D. M. frigidum (*fl r-p*); D. M. lancifolium (*fl pi, y* at base); Douglasia nivalis (*fl pi*); Draba aizoides (*fl y*); D. Aizoon (*fl y*); D. alpina (*fl y*); D. glacialis (*fl y*); D. Mawii (*fl w*); D. nivalis (*fl w*); D. violacea (*fl v-p*); Ebenus Sibthorpii (*fl p*); Epilobium obcordatum (*fl pi-p*); Epimedium alpinum (*fl r, y,* and *gy*); E. macranthum (*fl w*); E. Muschianum (*fl w*); E. pinnatum (*fl y*); E. rubrum (*fl r, y,* and *gy*); Erigeron aurantiacus (*fl y*); E. glaucus (*fl p*); E. grandiflorus (*fl p* or *w*); E. multiradiatus (*fl p*); E. speciosus (*fl v* and *y*); Erinus alpinus (*fl p* or *w*); Eritrichum nanum (*fl b, w* eye); Erodium macradenum (*fl v*); E. Manescavi (*fl p-r*); E. petræum (*fl p*); E. Reichardi (*fl w,* veined *pi*); E. trichomanefolium (*fl w-pi*); Erysimum alpinum (*fl y, sc*); E. pumilum (*fl g-y, sc*); Erythræa diffusa (*fl pi*); Erythronium americanum (*fl y*); E. dens-canis (*fl p-pi* or *w*); Funkia ovata (*fl b-l* or *w*); F. o. marginata (*fl b-l* or *w; fol g,* margined *w*); F. Sieboldiana (*fl w,* tinged *l*); F. subcordata (*fl w*); Galax aphylla (*fl w*); Gentiana acaulis (*fl b,* marked *y*); G. algida (*fl b,* and *c* marked *b*); G. Andrewsii (*fl b*); G. bavarica (*fl b*); G. cruciata (*fl b,* dotted *g*); G. Kurroo (*fl b,* sprinkled *w*); G. ornata (*fl b* and *w*); G. Pneumonanthe (*fl b, w,* &c.); G. punctata (*fl y,* dotted *p*); G. pyrenaica (*fl b* and *g*); G. septemfida (*fl b*); Geranium argenteum (*fl r,* dark stripes); G. cinereum (*fl r,* dark stripes); G. dahuricum (*fl p*); G. Endressii (*fl pi,* dark veins); G. ibericum (*fl b*); G. Lamberti (*fl l*); G. macrorhizon (*fl r* or *p*); G maculatum (*fl l*); G. sanguineum (*fl r*); G. s. lancastriense (*fl w-pi*); G. striatum (*fl pi,* dark stripes); G. Wallichianum (*fl p*); Geum coccineum (*fl p*); G. elatum (*fl y*); G. montanum (*fl y*); G. pyrenaicum (*fl y*); G. rivale (*fl r*); G. triflorum (*fl p, w,* and *p-r*); Globularia nana (*fl b*); G. vulgaris (*fl b*); Gypsophila cerastioides (*fl w,* veined *r*); G. paniculata (*fl w*); G. Stevenii (*fl w*); Haberlea rhodopensis (*fl l*); Hacquetia Epipactis (*fl y*); Helianthemum formosum (*fl y* and *bk*); H. globulariæfolium (*fl g-y,* spotted *bk*); H. halimifolium (*fl y*); H. scoparium (*fl y*); H. vulgare (*fl y, pi, r,* &c.); Heuchera hispida (*fl* veined *p; fol g*); H. sanguinea (*fl r; fol g*); Hieracium aurantiacum (*fl o-r*); Houstonia cærulea (*fl b* or *w*); Iberidella rotundifolia (*fl pi-l, y* eye, *sc*); Isopyrum thalictroides (*fl w; fol g*); Kœniga spinosa (*fl w*); Leontopodium alpinum (*fl; fol* woolly); Leucoium vernum (*fl w,* spotted *g, sc*); Lewisia rediviva (*fl pi, w* centre); Linaria alpina (*fl b-v, y* centre); L. Cymbalaria (*fl b, l,* or *w; fol* sometimes variegated); L. hepaticæfolia (*fl l-p*); Linnæa borealis (*fl w-pi, sc*); Linum alpinum (*fl b*); L. narbonense (*fl b* or *w*); Lithospermum Gastoni (*fl b*); L. prostratum (*fl b,* striped *r-v*); L. purpureo-cæruleum (*fl r,* at length *p*); Lotus corniculatus (*fl y*); Lupinus lepidus (*fl p-b,* spotted *w*); Lychnis alpina (*fl pi*); L. fulgens (*fl r*); L. Lagascæ (*fl pi, w* centre); L. pyrenaica (*fl pi*); L. Viscaria (*fl pi* or *r*); Mazus pumilio (*fl v*); Meconopsis cambrica (*fl y*); Merendera Bulbocodium (*fl pi-l*); Mertensia alpina (*fl b*); M. lanceolata (*fl b*); M. sibirica (*fl p-b* or *w*); M. virginica (*fl p-b*); Meum athamanticum (*fl w*); Micromeria Piperella (*fl*); Mimulus primuloides (*fl y*); Mitchella repens (*fl w,* tinged *p*); Mitella diphylla (*fl w*); M. pentandra (*fl y*); Mœhringia muscosa (*fl w*); Myosotis alpestris (*fl b, y* eye, *sc*); M. dissitiflora (*fl b*); Nertera depressa (*fr o*); Œnothera acaulis (*fl w,* fading to *r*); Œ. eximia (*fl w*); Œ. taraxacifolia (*fl w,* fading to *r*); Omphalodes Luciliæ (*fl l-b*); O. verna (*fl b,* throat *w*); Ononis Natrix (*fl y,* veined *r*); Onosma stellulatum tauricum (*fl y*); Ourisia coccinea (*fl r,* anthers *c*); O. Pearcei (*fl r*); Oxalis Acetosella (*fl w,* veined *p*); O. enneaphylla (*fl w* or *pi,* veined *p*); O. lobata (*fl y,* spotted *r*); O. tetraphylla (*fl r* or *p-v*); Oxytropis Lambertii (*fl pi-r*); O. montana (*fl b*); O. pyrenaica (*fl b*); Papaver alpinum (*fl y, pi,* or *w*); P. nudicaule (*fl y* or *w*); Pentstemon antirrhinoides (*fl y*); P. azureus (*fl b, r-p* at base); P. barbatus (*fl r*) and var.; P. campanulatus (*fl pi, v,* &c.); P. confertus (*fl g-y*); P. deustus (*fl y*); P. diffusus (*fl p*); P. Eatoni (*fl r*); P. glaber (*fl p, v,* or *b*); P. gracilis (*fl l-p* or *w*); P. Hartwegi (*fl r*); P. heterophyllus (*fl pi* or *pi-p*); P. Menziesii Douglasii (*fl l-p, pi-r* at base); P. Murrayanus (*fl r*); P. pubescens (*fl v* or *p,* or partly *w*); P. venustus (*fl p*); Petasites fragrans (*fl w, sc*); P. frigida (*fl w*); Phlox amœna (*fl p, pi,* or *w*); P. divaricata (*fl l* or *b*); P. reptans (*fl p* or *v*); P. subulata (*fl pi* or *w*); Phyteuma comosum (*fl p* or *b*); P. humile (*fl b*); Polemonium confertum (*fl b*); Polygonum affine (*fl pi-r*); P. vaccinifolium (*fl pi*); Potentilla alpestris (*fl y*); P. ambigua (*fl y*); P. nitida (*fl pi*); Pratia angulata (*fl w*); P. repens (*fl w,* tinged *v*); Primula Allionii (*fl mv, w* eye); P. altaica (*fl mv* or *p-r, y* eye); P. Auricula (*fl* variable); P. auriculata (*fl p, w* eye); P. calycina (*fl p*); P. capitata (*fl v-b*); P. cortusoides (*fl pi*); P. denticulata (*fl l*); P. d. cashmeriana (*fl p, y* eye); P. farinosa (*fl p, y* eye); P. glutinosa (*fl b-p*); P. japonica (*fl* variable); P. marginata (*fl pi-v*); P. minima (*fl pi* or *w*); P. nivalis (*fl w*); P. Parryi (*fl p, y* eye); P. rosea (*fl pi-r, y* eye); P. scotica (*fl p, y* eye); P. sikkimensis (*fl y*); P. spectabilis Wulfeniana (*fl pi-p*); P. Steinii (*fl p*); P. Stuartii (*fl y*); P. viscosa (*fl pi-p, w* eye); P. v. pedemontana (*fl pi-p, y-w* eye); P. vulgaris (*fl y*); Puschkinia scilloides (*fl w,* striped *b*); Pyrola rotundifolia (*fl w, sc*); P. secunda (*fl g-w*); Ramondia pyrenaica (*fl p* or *w*); Ranunculus aconitifolius (*fl w*); R. amplexicaulis (*fl w*); R. anemonoides (*fl w,* tinted *pi*); R. asiaticus (*fl* variable); R. a. sanguineus

Rockeries (Hardy Perennials)—*continued.*

Rockeries (Hardy Perennials)—*continued.*

(*fl p, y, o,* or variegated); R. cortusæfolius (*fl y*); R. gramineus (*fl y*); R. parnassifolius (*fl w* or *pi*); Romanzoffia sitchensis (*fl w*); Sanguinaria canadensis (*fl w*); Saponaria ocymoides (*fl r* or *pi*); Saxifraga aizoides (*fl o* or *y*, dotted *r*); S. aretioides (*fl y*); S. Burseriana (*fl c-w*); S. B. major (*fl w*); S. cæsia (*fl c-w*); S. cæspitosa (*fl w*); S. Camposii (*fl w*); S. Cotyledon (*fl w*; *fol* edged *w*); S. crassifolia (*fl r*); S. diversifolia (*fl y*); S. granulata (*fl w*); S. Hirculus (*fl* dotted *r*); S. Hostii (*fl w*, or *p*-dotted); S. hypnoides (*fl w*); S. ligulata (*fl r-w*); S. lingulata cochlearis (*fl w*; *fol g*); S. longifolia (*fl w*, dotted *r*; *fol g*); S. Maweana (*fl w*); S. moschata (*fl y* or *p*); S. oppositifolia (*fl p*); S. o. pyrenaica superba (*fl pi-l*); S. retusa (*fl p*; *fol* dotted); S. Rocheliana coriophylla (*fl w*); S. sancta (*fl y*); S. sarmentosa (*fl w*, spotted *r* and *y*; *fol g, p* beneath); S. Stracheyi (*fl pi*); S. umbrosa (*fl w*, marked *r*); S. valdensis (*fl w*); S. virginiensis (*fl w*); Scutellaria alpina (*fl p*); S. orientalis (*fl y*); Sedum acre aureum (*fol y*); S. Aizoon (*fl y*); S. album (*fl w*; *fol g* and *br*); S. anglicum (*fl w* or *pi*; *fol g*); S. brevifolium (*fl w*, ribbed *pi*; *fol pi*); S. erythrostictum (*fl g*, flushed *pi*); S. glaucum (*fl pi-w*; *fol g* and *r*); S. japonicum (*fl y*; *fol g*); S. kamtschaticum (*fl y*; *fol g*); S. lydium (*fl pi*; *fol g*, tipped *r*); S. maximum (*fl w*, spotted *r*; *fol g*); S. m. hæmatodes (*fol p*); S. pulchellum (*fl pi-p*); S. reflexum (*fl y*); S. Rhodiola (*fl g* or *r-p*); S. spectabile (*fl pi*); Sempervivum arachnoideum (*fl r*; *fol g* and *br*) and var.; S. arenarium (*fl y*); S. atlanticum (*fl r*; *fol g* and *r-br*); S. Boissieri (*fl r*; *fol g*); S. Braunii (*fl y*; *fol g*); S. calcaratum (*fl r-w*; *fol g*, tipped *r-br*); S. calcareum (*fl r*; *fol g*, tipped *r-br*); S. fimbriatum (*fl r*; *fol g* and *r*); S. Funckii (*fl r-p*; *fol g*); S. Heuffelii (*fl y*; *fol g*, tinted *r-br*); S. Lamottei (*fl pi*; *fol g*, tipped *r-br*); S. montanum (*fl p*; *fol g*); S. Pomelii (*fl pi-r*; *fol g*); S. soboliferum (*fl y*; *fol g*, tipped *r-br*); S. Wulfeni (*fl y*; *fol g*, tipped *r-br*); Silene acaulis (*fl pi* or *w*); S. alpestris (*fl w*); S. Elizabethæ (*fl pi, w,* and *p*); S. Hookeri (*fl pi*); S. maritima (*fl w*); S. pennsylvanica (*fl pi*); S. Saxifraga (*fl y* and *r-br*); S. Schafta (*fl p*); S. virginica (*fl r*); Soldanella alpina (*fl v*); S. montana (*fl p*); Statice latifolia (*fl b*); S. tatarica (*fl r*); Tiarella cordifolia (*fl w*); Trifolium alpestre (*fl p*); T. uniflorum (*fl b* and *p*); Vicia argentea (*fl pi*, spotted *bk*); Vinca major (*fl b-p*); V. minor (*fl v-p, w,* or *b*); Viola cornuta (*fl b*); V. cucullata (*fl v-b* or *p*) and var.; V. Munbyana (*fl v* or *y*) and var.; V. odorata (*fl b, v,* or *v-p, sc*) and vars.; V. pedata (*fl b* or *w*) and vars.; V. rothomagensis (*fl b*, striped *bk*); V. suavis (*fl b* and *w, sc*); V. tricolor (*fl* variable) and vars.; Wahlenbergia Kitaibelii (*fl b*); W. tenuifolia (*fl v-b, w* base); Wulfenia Amherstiana (*fl b*); W. carinthiaca (*fl b*).

Half-Hardy.—Annuals.—Abronia umbellata (*fl pi, sc*); Calceolaria chelidonioides (*fl y*); Grammanthes chloræflora (*fl o-y*, at length *o-r*); Grammatocarpus volubilis (*fl y*); Laurentia minuta (*fl p*); Loasa hispida (*fl y*, centre *g* and *w*); L. vulcanica (*fl w*); Martynia fragrans (*fl r-p*, throat *y, sc*); M. lutea (*fl o-y*, suffused *r*); M. proboscidea (*fl y, g, v,* &c.); Mentzelia bartonioides (*fl y*); Portulaca vars. (*fl*).

Perennials.—Amphicome arguta (*fl r*); A. Emodi (*fl pi* and *o*); Antirrhinum Asarina (*fl w* and *y*, spotted *p*); A. molle (*fl w* and *y*, striped *p*); Arabis blepharophylla (*fl pi*); Bellium minutum (*fl w* and *y*); Chionographis japonica (*fl w*); Darlingtonia californica (*fl w* or *g*, marked *r-br*; pitchers *g*, marked *w* and *r-br*); Myosotis azorica (*fl p*, at length *b*); Oxalis arenaria (*fl v-p*); Saxifraga cortusæfolia (*fl w*); S. Fortunei (*fl w*); Statice callicoma (*fl pi*); S. sinuata (*fl p, y*); Viola hederacea (*fl b* or *w*); V. pedunculata (*fl y*).

SHRUBBERIES.—Many hardy herbaceous plants may be introduced with good effect into the Shrubbery, although the latter term, strictly speaking, means a plantation of shrubs. Shade-loving subjects, and such as are found growing in woodlands in their native countries, are eminently suited for the purpose. The following lists

Shrubberies—*continued.*

comprise most of the hardy herbaceous plants that will thrive in the Shrubbery.

Annuals.—Adonis æstivalis (*fl r*); A. autumnalis (*fl r*); Agrostemma cœli-rosa (*fl pi, w,* or *p*); A. c-r. fimbriata (*fl p*); Agrostis nebulosa (*fl*); A. pulchella (*fl*); Anagallis grandiflora (*fl r, b,* &c.) and vars.; Argemone albiflora (*fl w*); A. hirsuta (*fl w*); A. ochroleuca (*fl y*); Bartonia albescens (*fl y*); B. aurea (*fl y*); Blumenbachia insignis (*fl w*); Calendula maderensis (*fl o*); C. officinalis (*fl o*); Callistephus chinensis (*fl p,* &c.); Centaurea Cyanus (*fl p* and *b*); C. suaveolens (*fl y, sc*); Centranthus macrosiphon (*fl r* or *w*); Chlora perfoliata (*fl y*); Chrysanthemum carinatum (*fl w, p*); C. coronarium (*fl y*); C. segetum (*fl y*); C. s. grandiflorum (*fl y*); Clarkia elegans (*fl r*); C. pulchella (*fl p*); Collinsia bicolor (*fl w* and *pi-p*); C. grandiflora (*fl p* and *b*); C. verna (*fl w* and *b*); Convolvulus tricolor (*fl y, b,* and *w*); Coreopsis Drummondi (*fl y*, banded *r-br*); C. tinctoria (*fl y*, blotched *p-br*); Crepis rubra (*fl r*); Delphinium Ajacis (*fl b, r,* or *w*); Erysimum Perofskianum (*fl o-y*); Eucharidium concinnum (*fl l-p*); Gaillardia amblyodon (*fl r*); Gilia achilleæfolia (*fl p-b, w,* or *r*); G. androsacea (*fl l, p,* or *w, y* or dark throat); G. capitata (*fl b*); G. liniflora (*fl w*); G. tricolor (*fl o-y, p,* and *w,* &c.); Glaucium phœniceum (*fl r*, spotted *bk*); Helianthus annuus (*fl* variable, usually *y*); Hordeum jubatum (*fl*); Impatiens coronaria (*fl w*); I. Roylei (*fl p*); Linaria bipartita (*fl v-p, o,* and *w*); L. reticulata (*fl p* and *w*); L. spartea (*fl y*); Linum grandiflorum (*fl pi*); L. g. rubrum (*fl r-pi*); Loasa Pentlandii (*fl o*); Lupinus nanus (*fl l* and *b*); Madia elegans (*fl y*); Malcolmia maritima (*fl l, pi, r,* or *w*); Malope trifida (*fl p* or *w*); Matricaria inodora flore-pleno (*fl w*); Nemophila insignis (*fl b, w* eye, &c.) and vars.; Nigella damascena (*fl w* or *b*); N. hispanica (*fl b, r* stamens); Œnothera amœna (*fl pi*, spotted *r*); Œ. a. rubicunda (*fl l-p*, blotched); Œ. bistorta Veitchiana (*fl y*, spotted *r*); Œ. Whitneyi (*fl pi-r*, blotched *r*); Oxalis corniculata (*fl y*); O. c. rubra (*fl y*; *fol p*); O. valdiviensis (*fl y*, striped *r*); Panicum capillare (*fl*); P. miliaceum (*fl*); Papaver Rhœas (*fl r*) and vars.; P. somniferum (*fl* variable); Phacelia campanularia (*fl b*, spotted *w*); P. viscida (*fl b, p*); P. Whitlavia (*fl b*); Polygonum orientale (*fl pi-p* or *w*); Reseda odorata (*fl y-w,* &c.); Saponaria calabrica (*fl w*); Scabiosa atropurpurea (*fl r*) and vars.; Schizanthus pinnatus (*fl v* or *l*, and *y,* &c.) and vars.; Silene pendula (*fl pi*); S. p. compacta (*fl pi*); Silybum Marianum (*fl pi-p*); Tagetes erecta (*fl y*); T. patula (*fl y* or *y-br*); T. tenuifolia (*fl y*); Vesicaria grandiflora (*fl y*); Vicia onobrychioides (*fl p*); Xeranthemum annuum (*fl p*).

Biennials.—Althæa caribæa (*fl pi*); Aster Bigelovii (*fl l* and *y*); Bromus brizæformis (*fl*); Campanula Medium (*fl b, p,* and *w*); C. sibirica divergens (*fl v*); Centaurea Fenzlii (*fl y*); Chlora grandiflora (*fl y*); Digitalis purpurea (*fl p*, varying to *w*); Glaucium flavum (*fl o*); Grindelia grandiflora (*fl y* or *o*); Michauxia lævigata (*fl w*); Myosotis sylvatica (*fl b, y* throat); Œnothera biennis (*fl y, sc*); Oxalis corniculata rubra (*fl y*; *fol p*); Tragopogon glaber (*fl p*); Verbascum Chaixii (*fl y*).

Perennials.—Aconitum album (*fl w*); A. angustifolium (*fl b*); A. Anthora (*fl y*); A. A. nemorosum (*fl y*); A. autumnale (*fl b-p*); A. barbatum (*fl c*); A. chinense (*fl b*); A. eminens (*fl b*); A. gracile (*fl b* or *v*); A. Halleri (*fl v*); A. H. bicolor (*fl w*, variegated *b*); A. japonicum (*fl pi*); A. lycoctonum (*fl v*); A. Napellus (*fl b*); A. ochroleucum (*fl c*); A. Ottonianum (*fl b*, variegated *w*); A. paniculatum (*fl v*); A. pyrenaicum (*fl y*); A. rostratum (*fl v*); A. tauricum (*fl b*); A. uncinatum (*fl b*); A. variegatum (*fl b*); A. v. albiflorum (*fl w*); A. v. bicolor (*fl w-b*); A. vulparia (*fl y*); A. v. septentrionale (*fl b*); A. Willdenovii (*fl b-p*); Actæa alba (*fl w*); A. spicata (*fl w* or *b*); A. s. rubra (*fl w* or *b*; *fr r*); Actinomeris helianthoides (*fl y*); A. procera (*fl y*); A. squarrosa (*fl y*); Adonis pyrenaica (*fl y*); A. vernalis (*fl y*); Agrostemma coronaria (*fl w, r* centre, &c.); A. flos-Jovis

Shrubberies (Perennials)—*continued.*

(*fl p* or *r*); Amsonia salicifolia (*fl b*); A. Tabernæmontana (*fl b*); Anemone decapetala (*fl c* or *y*); A. dichotoma (*fl w*, tinged *r*); A. fulgens (*fl r, bk* centre); A. nemorosa (*fl w*); A. n. cærulea (*fl b*); A. n. flore-pleno (*fl w*); A. n. Robinsoniana (*fl b*); A. n. rosea (*fl pi*); A. ranunculoides (*fl y* or *p*); A. sylvestris (*fl w*); A. virginiana (*fl p* or *p-g*); Antirrhinum majus (*fl*); Apocynum androsæmifolium (*fl r*); Aralia edulis (*fol g*); A. nudicaulis (*fol g*); A. racemosa (*fol g*); Artemisia cana (*fol w*); Arum italicum (*fl g-y* or *w*); A. proboscideum (*fl g-p*); A. tenuifolium (*fl w*); Asperula longiflora (*fl w, y,* and *r*); A. montana (*fl pi*); A. odorata (*fl w*); Astrantia carniolica (*fl w*; *fol g,* tinged *r*); A. helleborifolia (*fl pi*); A. major (*fl pi*); Berkheya purpurea (*fl p*); Boltonia asteroides (*fl pi*); B. glastifolia (*fl pi*); Brodiæa congesta (*fl b*); B. c. alba (*fl w*); Bulbocodium vernum (*fl v-p, w* spot); Buphthalmum speciosissimum (*fl y*); Callirhoe digitata (*fl r-p*); C. Papaver (*fl v-r*); Centaurea alpina (*fl y*); C. atropurpurea (*fl p*); C. aurea (*fl y*); C. babylonica *fl y*); C. macrocephala (*fl y*); Centranthus ruber (*fl r*); Chelone Lyoni (*fl p*); C. nemorosa (*fl pi-p*); Cimicifuga americana (*fl w*); C. japonica (*fl w*); C. racemosa (*fl w*); Clematis aromatica (*fl v-b, sc*); Clintonia Andrewsiana (*fl pi*); Cnicus altissimus (*fl p*); Convallaria majalis (*fl w, sc*); Coreopsis grandiflora (*fl y*); Corydalis bracteata (*fl y*); C. cava (*fl p*); C. c. albiflora (*fl w*); C. Kolpakowskiana (*fl pi* or *p*); C. lutea (*fl y*); C. Marschalliana (*fl y*); C. nobilis (*fl y,* tipped *g*); C. solida (*fl p*); Crambe cordifolia (*fl w*); Datisca cannabina (*fl y*; *fol g*); Delphinium azureum (*fl b*); D. cashmirianum (*fl b*); D. exaltatum (*fl b* or *w*); D. formosum (*fl b*); D. grandiflorum (*fl b,* varying to *w*); D. nudicaule (*fl r* and *y*); Dentaria digitata (*fl p*); D. diphylla (*fl w* and *p*); Dicentra spectabilis (*fl pi-r*); Digitalis ambigua (*fl y,* reticulated *br*); Doronicum plantagineum excelsum (*fl y*); Dracunculus vulgaris (*fl br*); Epilobium angustifolium (*fl r*); E. Dodonæi (*fl pi*); E. hirsutum (*fl pi* or *w*); E. rosmarinifolium (*fl r*); Eranthis hyemalis (*fl y*); E. sibiricus (*fl y*); Erythronium americanum (*fl y*); E. dens-canis (*fl p-pi* or *w*); Funkia ovata (*fl b-l* or *w*); F. o. marginata (*fl b-l* or *w*; *fol g,* margined *w*); F. Sieboldiana (*fl w,* tinged *l*); F. subcordata (*fl w*); Galanthus Elwesii (*fl w,* spotted *g*); G. nivalis (*fl w,* marked *g*); G. plicatus (*fl g-w*); Gladiolus Brenchleyensis (*fl r*); Gynerium argenteum (*fl* silky, sometimes tinted *p* or *y*); Helenium autumnale (*fl y*); Helianthus decapetalus multiflorus (*fl y*); H. orgyalis (*fl y*); H. rigidus (*fl br* and *y*); Hemerocallis Dumortieri (*fl o-y,* tinged *br*); H. flava (*fl o-y, sc*); H. fulva (*fl y*); H. Middendorfi (*fl y*); H. minor (*fl y*); Inula glandulosa (*fl y*); I. Hookeri (*fl y, sc*); Kniphofia aloides (*fl* coral-*r,* fading to *g-y*); K. Burchelli (*fl r* and *y,* tipped *g*); K. Leichtlinii (*fl r* and *y*); K. Rooperi (*fl o-r,* turning *y*); Leucoium æstivum (*fl w,* tipped *g*); L. vernum (*fl w,* spotted *g, sc*); Lilium bulbiferum (*fl r*); L. canadense (*fl y* to *r,* spotted *r-p*); L. candidum (*fl w,* rarely tinged *p*); L. Catesbæi (*fl o-r,* spotted *p*); L. chalcedonicum (*fl r,* rarely *y*); L. columbianum Buschianum (*fl r,* spotted *bk* below); L. croceum (*fl y,* tinted *r*); L. davuricum (*fl r*); L. elegans (*fl r,* rarely spotted); L. e. armeniacum (*fl r,* spotted *y*); L. e. atrosanguineum (*fl* blotched *r*); L. e. sanguineum (*fl r* and *y*); L. Hansoni (*fl r-o,* dotted *p*); L. Krameri (*fl w,* tinged *r, sc*); L. Leichtlinii (*fl y,* marked *p* and *r*); L. longiflorum (*fl w, sc*); L. l. eximium (*fl w*); L. Martagon (*fl p-r,* spotted *p*); L. monadelphum (*fl y,* tinged *r* at base) and var.; L. oxypetalum (*fl l-p,* dotted *p* within); L. pardalinum (*fl o-r,* variable); L. Parryi (*fl y,* spotted *br-r, sc*); L. philadelphicum (*fl o-r,* spotted *p* below); L. pomponium (*fl r*); L. pseudo-tigrinum (*fl r,* spotted *bk* within); L. pyrenaicum (*fl y*); L. roseum (*fl l*); L. speciosum (*fl w,* or spotted *r*); L. s. albiflorum (*fl w*); L. s. punctatum (*fl w,* spotted *r*); L. s. roseum (*fl w,* tinted *pi*); L. superbum (*fl o-r,* spotted); L. tenuifolium (*fl*); L. tigrinum (*fl o-r,* spotted *p-bk*) and vars.; L. Washingtonianum (*fl w,* tinted

Shrubberies (Perennials)—*continued.*

p or *l*); Melittis Melissophyllum (*fl c-w,* spotted *pi* or *p*); Mertensia alpina (*fl b*); M. lanceolata (*fl b*); M. sibirica (*fl p-b* or *w*); M. virginica (*fl p-b*); Meum athamanticum (*fl w*); Myrrhis odorata (*fl w*); Narcissus biflorus (*fl w, y* crown); N. Bulbocodium (*fl y*) and vars.; N. incomparabilis (*fl y*) and vars.; N. Jonquilla (*fl y, sc*); N. Macleai (*fl w* and *y*); N. poeticus (*fl w,* crown edged *r, sc*) and vars.; N. Pseudo-Narcissus (*fl y*) and vars.; N. Tazetta (*fl w* and *y,* &c., *sc*) and vars.; N. triandrus (*fl w* or *y,* &c.) and vars.; Œnothera acaulis (*fl w,* turning *r*); Œ. californica (*fl w,* varying to *pi, y* centre, *sc*); Œ. eximia (*fl w*); Œ. glauca (*fl y*); Œ. g. Fraseri (*fl y*); Œ. linearis (*fl y, sc*); Œ. missouriensis latifolia (*fl y*); Œ. pallida (*fl w, y* at base); Œ. speciosa (*fl w,* fading to *r*); Œ. taraxacifolia (*fl w,* fading to *r*); Omphalodes nitida (*fl w*); O. verna (*fl b,* throat *w*); Onopordon Acanthium (*fl p*); Ornithogalum narbonense (*fl w,* striped *g*); O. nutans (*fl w* and *g*); O. pyramidale (*fl w,* striped *g*); O. umbellatum (*fl w* and *g*); Oxalis Acetosella (*fl w,* veined *p*); O. lobata (*fl y,* spotted *r*); O. tetraphylla (*fl r* or *p-v*); Pæonia albiflora (*fl w, p,* &c.) and vars.; P. Emodi (*fl w*); P. officinalis (*fl r*); P. tenuifolia (*fl r*); P. Wittmanniana (*fl y-w*); Panicum virgatum (*fl*); Papaver bracteatum (*fl r*); P. nudicaule (*fl y* or *w*); P. orientale (*fl r,* spotted *p*); P. pilosum (*fl r* or *o,* marked *w*); Petasites fragrans (*fl w, sc*); P. frigida (*fl w*); Phalaris arundinacea (*fl p*); Phlomis herba-venti (*fl b-v*); Phytolacca decandra (*fl w*; *fr p*); Polemonium cæruleum (*fl b*; *fol* sometimes variegated); P. humile (*fl b* or *p*) and var.; P. reptans (*fl b* or *w*); Polygonatum biflorum (*fl g*); P. multiflorum (*fl w*; *fr bk*) and vars.; Polygonum affine (*fl pi-r*); P. amplexicaule (*fl pi-r* or *w*); P. compactum (*fl w*); P. cuspidatum (*fl c-w*); P. sachalinense (*fl g-y*); Potentilla ambigua (*fl y*); P. argyrophylla (*fl y*); P. congesta (*fl w*); P. Hopwoodiana (*fl* variegated *pi* and *y*); P. nitida (*fl pi*); P. unguiculata (*fl w*); Prenanthes purpurea (*fl p*); Primula Auricula (*fl* variable); P. elatior (*fl y*); P. japonica (*fl* variable); P. officinalis (*fl y*); P. vulgaris (*fl y*); Pulmonaria angustifolia (*fl pi,* at length *b*); P. saccharata (*fl pi*); Pyrethrum Tchihatchewii (*fl w* and *y*); Rheum Emodi (*fol g*); R. officinale (*fol g*); Rudbeckia grandiflora (*fl y* and *p*); R. maxima (*fl y*); R. pinnata (*fl y*); R. purpurea (*fl r-p,* tipped *g*); R. speciosa (*fl o* and *bk-p*); Sanguinaria canadensis (*fl w*); Saponaria officinalis (*fl l* or *w*); Saussurea pulchella (*fl p*); Saxifraga Camposii (*fl w*); S. Cotyledon (*fl w*; *fol* edged *w*); S. crassifolia (*fl r*); S. granulata (*fl w*); S. hypnoides (*fl w*); S. ligulata (*fl r-w*); S. Stracheyi (*fl pi*); S. umbrosa (*fl w,* marked *r*); Scabiosa amœna (*fl l* or *pi*); Scilla amœna (*fl b* or *w*); S. hispanica (*fl b, w,* &c.); S. nutans (*fl b, p, w,* or *pi*); S. peruviana (*fl l, r,* or *w*); S. pratensis (*fl b*); S. sibirica (*fl b*); Scolymus grandiflorus (*fl y*); Scopolia carniolica (*fl r, y* or *g* within); Sedum acre aureum (*fol y*); S. album (*fl w*; *fol g* and *br*); S. dasyphyllum (*fl pi*); S. erythrostictum (*fl g,* flushed *pi*); S. glaucum (*fl pi-w*; *fol g* and *r*); S. kamtschaticum (*fl y*; *fol g*); S. Maximowiczii (*fl y*; *fol g*); S. maximum (*fl w,* spotted *r*; *fol g*); S. m. hæmatodes (*fol p*); S. populifolium (*fl w* or *pi*); S. reflexum (*fl y*); S. Rhodiola (*fl g* or *r-p*); S. sexangulare (*fl y*; *fol g*); S. spectabile (*fl pi*); S. Telephium (*fl pi* or *w*) and vars.; Senecio Doria (*fl y*); S. Doronicum (*fl y*); S. pulcher (*fl p,* disk *y*); Sida Napæa (*fl w*); Silene pennsylvanica (*fl pi*); Solidago Drummondii (*fl y*); S. lanceolata (*fl y*); S. speciosa (*fl y*); S. Virgaurea (*fl y*); Spiræa Aruncus (*fl w*); S. astilboides (*fl w*); S. Filipendula (*fl w* or *p*); S. palmata (*fl r*); S. Ulmaria (*fl w*); Stachys grandiflora (*fl v*); S. lanata (*fl* striped); S. Maweana (*fl y-w,* blotched *p*); Stipa pennata (*fl*); Streptopus roseus (*fl p*); Stylophorum diphyllum (*fl y*); Symphytum caucasicum (*fl b*); S. officinale bohemicum (*fl r* or *r-p*); S. tuberosum (*fl y*); Tanacetum leucophyllum (*fl y*; *fol y-w*); Teucrium Chamædrys (*fl pi,* spotted *w* and *r*); Thaliotrum aquilegifolium (*fl w*); T. a. atropurpureum (*fl w* and *p*); T. flavum (*fl y*); T. minus (*fl y*

Shrubberies (Perennials)—*continued.*

and *g*); T. tuberosum (*fl w*); Tradescantia virginica (*fl v, p,* or *w*); Trillium erectum (*fl p*); T. erythrocarpum (*fl w,* striped *p*); T. grandiflorum (*fl w,* turning *pi*); T. nivale (*fl w*); Trollius altaicus (*fl o* or *y*); T. asiaticus (*fl y*); T. europæus (*fl y*); Tulipa australis (*fl* flushed *r*); T. Clusiana (*fl w, r,* and *bk*); T. Eichleri (*fl r,* marked *y* and *bk*); T. elegans (*fl r, y* eye); T. Gesneriana (*fl r, y,* &c.); T. Greigi (*fl r,* blotched *bk*); T. macrospeila (*fl r,* blotched *bk* and *y*); T. Oculus-solis (*fl r,* blotched *bk*); T. præcox (*fl r,* blotched *bk*); T. pubescens (*fl* variable, *sc*); T. retroflexa (*fl y*); T. suaveolens (*fl r* and *y, sc*); T. sylvestris (*fl y, sc*); T. varieties (*fl*); Tussilago Farfara variegata (*fol g* and *c-w*); Valeriana Phu aurea (*fl w*; *fol g* and *y*); Veratrum album (*fl w* and *g*); V. nigrum (*fl b-p*); Veronica gentianoides (*fl b*); V. incana (*fl b*); V. longifolia (*fl l*); V. saxatilis (*fl b*); V. spicata (*fl b*); V. Teucrium (*fl b*); V. virginica (*fl w* or *b*); Vesicaria utriculata (*fl y*); Vicia argentea (*fl pi,* spotted *bk*); V. oroboides (*fl b*); Vinca major (*fl b-p*); V. minor (*fl v-p, w,* or *b*); Viola cornuta (*fl b*); V. cucullata (*fl v-b* or *p*) and var.; V. Munbyana (*fl v* or *y*) and var.; V. odorata (*fl b, v,* or *v-p, sc*) and vars.; V. pedata (*fl b* or *w*) and vars.; V. rothomagensis (*fl b,* striped *bk*); V. suavis (*fl b* and *w, sc*); V. tricolor (*fl* variable) and vars.

STOVE.—Success in the cultivation of a large proportion of the most beautiful plants can only be secured in a house where a high temperature and a moist atmosphere are constantly maintained. The following lists comprise the choicest Stove plants. The average temperatures of a Stove should range as follows: Winter, day, 60deg. to 70deg.; night 60deg. Summer, day, 70deg. to 85deg.; night, 65deg.

ANNUALS.—Citrullus vulgaris (*fr*); Coccocypselum repens (*fl b*); Desmodium gyrans (*fl v*; *fol g*); Euryale ferox (*aq, fl v*); Ipomœa Bona-nox (*fl w*); I. rubro-cærulea (*fl b*); Mimosa pudica (*fl r*); Physidium cornigerum (*fl p*); Sonerila stricta (*fl pi-p*); Torenia asiatica (*fl b* and *v*); T. flava (*fl y, p* eye); T. Fournieri (*fl v, y,* and *l*); Trichosanthes palmata (*fl* and *fr*); Victoria regia (*aq, fl w,* and *p* or *pi*; *fol g*).

BIENNIAL.—Cleome rosea (*fl pi*).

PERENNIALS.—Æchmea calyculata (*fl y* and *r*); Æ. cœlestis (*fl b*); Æ. cœrulescens (*fl b*; *fr b* and *w*); Æ. discolor (*fl r*; *fol g* and *p*); Æ. distichantha (*fl pi, p,* and *r*); Æ. fasciata (*fl pi*; *fol g,* banded *w*); Æ. fulgens (*fl r,* tipped *b*); Æ. glomerata (*fl v* and *r*); Æ. hystrix (*fl r*); Æ. Mariæ-Reginæ (*fl b* and *pi*); Æ. spectabilis (*fl pi* and *r*); Æ. Veitchii (*fl r*); Agalmyla staminea (*fl r*); Aglaonema commutatum (*fl w*; *fol g,* blotched *gy*); A. Mannii (*fl w* and *r*; *fol g*); A. pictum (*fl c-y* and *w*; *fol g,* blotched *gy*); Alpinia albo-lineata (*fol g,* banded *w*); A. nutans (*fl pi, sc*; *fol*); A. vittata (*fol* striped *g* and *w*); Amomum angustifolium (*fl y*); A. Cardamomum (*fl br*); A. Granum Paradisi (*fl w,* tinged *y* and *pi*); Amorphophallus Titanum (*fl p* and *g*; *fol g*); Ananas macrodonta (*fr sc*); A. Porteana (*fol g,* banded *y*); A. sativa (*fr r-y*); A. s. variegata (*fol g, c-y,* and *r*); Anchomanes Hookeri (*fl p* and *w*; *fol g*); Angelonia salicariæfolia (*fl b*); Anthurium acaule (*fl b, sc*; *fol g*); A. Andreanum (*fl y* and *o-r*; *fol g*); A. Bakeri (*fl g, pi,* and *r*; *fol g*); A. crystallinum (*fol g* and *w*); A. ferrierense (*fl r* and *w*; *fol g*); A. Harrisii pulchrum (*fl c-w* and *r*; *fol g* and *w*); A. insigne (*fol* bronzy *g*); A. Kalbreyeri (*fol g*); A. Lindenianum (*fl w* and *p, sc*; *fol g*); A. macrolobum (*fol g*); A. ornatum (*fl w* and *p*; *fol g*); A. regale (*fol g,* veined *w*); A. Scherzerianum (*fl r* and *o*; *fol g*) and vars.; A. splendidum (*fol g* and *g-y*); A. subsignatum (*fol g*); A. Veitchii (*fol g*); A. Waluiewi (*fol g* or *r*); A. Waroqueanum (*fol g*); Begonia albo-coccinea (*fl pi* and *w*); B. gogoensis (*fl pi*; *fol* bronzy, *r* beneath); B. heracleifolia (*fl pi*; *fol g*) and vars.; B. manicata (*fl pi*; *fol g*); B. prismatocarpa (*fl o* and *y*; *fol g*); B. Rex (*fol*) and vars.; B. socotrana (*fl pi*; *fol g*);

Stove (Perennials)—*continued.*

B. Thwaitesii (*fol g, r-p, w,* and *r*); Bertolonia maculata (*fl v-p*; *fol g*); B. marmorata (*fol g* and *w, p* beneath); B. pubescens (*fol g* and *br*); Billbergia Baraquiniana (*fl g*; *fol g* and *w*); B. iridifolia (*fl r* and *y,* tipped *b*); B. Liboniana (*fl r, w,* and *p*); B. marmorata (*fl b* and *r*; *fol g* and *r-br*); B. Moreli (*fl r* and *p-v*); B. pyramidalis (*fl r,* bracts *pi*); B. Quesneliana (*fl p* and *pi*; *fol g*); B. rosea-marginata (*fl b* and *pi*; *fol g*); B. Saundersii (*fl r, y,* and *b*; *fol g, w,* and *p*); B. thyrsoidea (*fl*); B. zebrina (*fl g* and *pi*; *fol g,* zoned *gy*); Brachyspatha variabilis (*fl g-p, w,* and *r*; *fol g*); Bromelia bicolor (*fl r*; *fol g* and *r*); B. bracteata (*fl pi* and *r*); B. Fernandæ (*fl y* and *o-r*); Burbidgea nitida (*fl o-r*); Caladium argyrites (*fol g,* &c.); C. Chantinii (*fol r, w,* and *g*); C. Devosianum (*fol g,* blotched *w* and *pi*); C. Kochii (*fol g,* spotted *w*); C. Lemaireanum (*fol g,* veined *w*); C. Leopoldi (*fol g, r,* and *pi*); C. macrophyllum (*fol g,* blotched *g-w*); C. maculatum (*fol g,* spotted *w*); C. marmoratum (*fol g,* and *gy* or *si*); C. rubrovenium (*fol g-gy,* veined *r*); C. sanguinolentum (*fol g, w,* and *r*); C. Schomburgkii (*fol g,* veined *w*); C. Verschaffeltii (*fol g,* spotted *r*); C. varieties (*fol*); Calathea arrecta (*fol g, r* beneath); C. Baraquinii (*fol g,* banded *si-w*); C. bella (*fol g* and *gy-g*); C. fasciata (*fol g, w,* and *p*); C. illustris (*fol g* and *pi*); C. Kerchoviana (*fol gy-g,* blotched *p*); C. leopardina (*fol y-g,* blotched *g*); C. Lindeni (*fol g, p-pi* beneath); C. Makoyana (*fol g, c-y,* and *w*); C. Massangeana (*fol g, si, r*); C. micans (*fol g,* striped *w*); C. nitens (*fol g*); C. ornata (*fol y-g, p* beneath) and vars.; C. pardina (*fl y*; *fol g,* blotched *br*); C. princeps (*fol g* and *y-g, p* beneath); C. tubispatha (*fol g-y,* blotched *br*); C. Vanden Heckei (*fol g* and *si, p-r* beneath); C. Veitchii (*fol g,* blotched *y, p* beneath); C. Wallisii (*fol g*); C. Warscewiczii (*fol g,* striped *y-g*); C. zebrina (*fol g,* barred *g-p, g-p* beneath); Canistrum aurantiacum (*fl o-y*); C. eburneum (*fl w* and *g*; *fol c* and *g*); Canna iridiflora (*fl pi, y* spot); Caraguata Van Volxemii (*fl y*); C. Zahnii (*fl y*; *fol y,* striped *r*); Carludovica atrovirens (*fol g*); C. palmata (*fol g*); C. rotundifolia (*fol g*); Centropogon Lucyanus (*fl pi-r*); Centrosolenia bullata (*fl y-w*; *fol* bronzy *g, r* beneath); C. picta (*fl w*); Ceropegia elegans (*fl p*); C. Thwaitesii (*fl y,* spotted *r*); Chirita lilacina (*fl b* and *w,* blotched *y*); C. Moonii (*fl p*); Cochliostema Jacobinianum (*fl b, sc*); C. odoratissimum (*fl y-g, r, b,* and *w, sc*); Colocasia antiquorum (*fl g*; *fol g*); C. indica (*fl br*; *fol g*); C. odorata (*fl w, sc*; *fol g*); Columnea Schiedeana (*fl y* and *br*); Cordyline albo-rosea (*fol g,* edged *pi*); C. amboynensis (*fol g, r,* and *p*); C. Baptistii (*fol g, y,* and *pi*); C. gloriosa (*fol g* and *o*); C. Guilfoylei (*fol r, pi, w,* and *g*); C. imperialis (*fol g,* rayed *r* or *pi*); C. magnifica (*fol pi*); C. ornata (*fol g,* margined *pi*); C. Robinsoniana (*fol g* and *br-r*); C. terminalis (*fol g* or bronze, and *r*); Corynophallus Afzelii (*fl w* and *p*; *fol g*) and vars.; Costus igneus (*fl o-r,* C. Malortieanus (*fl y,* banded *o-r*); Crinum amabile (*fl r, sc*); C. Balfourii (*fl w,* tube *g*); C. cruentum (*fl r*); C. giganteum (*fl w, sc*); C. Kirkii (*fl w,* striped *r*); C. purpurascens (*fl, r-p*); C. zeylanicum (*fl g* or tinted *r*); Cryptocoryne ciliata (*fl g* and *p, sc*); Curculigo recurvata (*fl y*; *fol g*); C. r. striata (*fol g,* banded *w*); C. r. variegata (*fol g,* variegated *w*); Curcuma albiflora (*fl w* and *y*); C. australasica (*fl y,* bracts *pi*); C. cordata (*fl r-y*); C. petiolata (*fl y,* bracts *pi-p*); C. Roscoeana (*fl r,* bracts *o*); C. rubricaulis (*fl r*); Cyanophyllum magnificum (*fol g* and *w, r-p* beneath); Cyanotis kewensis (*fl pi*); Dalechampia Roëzliana (*fl* bracts *pi, sc*); Desmodium Skinneri albo-nitens (*fl p*; *fol g,* lined *w*); Dichorisandra leucophthalmus (*fl b-p*); D. musaica (*fl b*; *fol g* and *w, r-p* beneath); D. thyrsiflora (*fl b*); Dichrotrichum ternateum (*fl r*); Didymocarpus primulæfolia (*fl l*); Dieffenbachia amœna (*fol g,* blotched *w* and *y*); D. Baraquiniana (*fol g* and *w*); D. Bausei (*fol g* and *y-g,* spotted *w*); D. brasiliensis (*fol g,* blotched *w*); D. chelsoni (*fol g, gy,* and *y-g*); D. eburnea (*fol g,* spotted *w*); D. latimaculata (*fol g, y-g,*

Stove (Perennials)—*continued.*

and *w*); D. Leopoldi (*fol g* and *w*); D. magnifica (*fol* variegated *g* and *w*); D. majestica (*fol g, y,* and *si*); D. nobilis (*fol g,* blotched *w*); D. princeps (*fol g, y,* and *si-gy*): D. Regina (*fol g-w* and *g*); D. Rex (*fol g,* blotched *w*); D. Wallisii (*fol* variegated *g* and *gy*); Dioscorea bulbifera (*fol g*); D. multicolor (*fol* variegated) and vars.; Dorstenia argentata (*fol g,* banded *si*); D. Mannii (*fol g*); Dracontium asperum (*fl p-br; fol g, p,* and *w*); Eichhornia azurea (*aq, fl b; fol g*); E. crassipes (*aq, fol g*); Epipremnum mirabile (*fol g*); Episcia bicolor (*fl w* and *p*); E. chontalensis (*fl l, y,* and *w*); E. fulgida (*fl r*); E. villosa (*fl w,* marked *p*); Eucharis candida (*fl w*); E. grandiflora (*fl w*); E. Sanderiana (*fl w*); Eulophia macrostachya (*fl,* lip *y,* striped *r-p*); Eurycles amboinensis (*fl w*); Fittonia gigantea (*fl r; fol g,* veined *r*); T. Verschaffelti (*fol g,* veined *r*) and vars.; Gesnera Cooperi (*fl r,* throat spotted); G. discolor (*fl r*); G. Donkelaariana (*fl r; fol g,* tinged *p* and *r*); G. exoniensis (*fl o-r,* throat *y*); G. nægelioides (*fl pi, r,* and *y*); G. pyramidalis (*fl o-r* and *o,* spotted); G. varieties (*fl*); Globba atrosanguinea (*fl y* and *r*); G. Schomburgkii (*fl o-r*); Gloriosa superba (*fl o* and *r*) and var.; Gloxinia diversifolia (*fl*); G. gesneroides (*fl r*); G. glabra (*fl, w* and *y,* spotted *p*); G. maculata (*fl p-b*); G. pallidiflora (*fl b*); G. varieties (*fl*); Gravesia guttata (*fol g,* dotted *pi*) and vars.; Guzmannia erythrolepis (*fl w* and *p-r*); G. tricolor (*fl w, y-g, r,* and *bk*); Gymnostachyum ceylanicum (*fl w,* tipped *g* and *y; fol g* and *w*); G. venusta (*fl p*); Hæmanthus abyssinicus (*fl r*); H. cinnabarinus (*fl r*); H. Kalbreyeri (*fl r*); H. Katherinæ (*fl r*); H. puniceus (*fl o-r,* stamens *y* or *o*); Hedychium angustifolium (*fl r*); H. coronarium (*fl w, sc*); H. flavosum (*fl y, sc*); Heliconia aureo-striata (*fol g,* lined *y*); H. Bihai (*fol*); H. psittacorum (*fol*); H. triumphans (*fol g,* striped *bk*); Homalomena Roëzlii (*fl br* and *c; fol g,* blotched *y*); H. Wallisii (*fl r; fol g,* edged *w,* blotched *y*); Hymenocallis amœna (*fl w, sc*); H. macrostephanum (*fl w, sc*); H. speciosa (*fl w, sc*); Hypoestes sanguinolenta (*fl p* and *w; fol g,* banded *p*); Hypolytrum latifolium (*fl br*); Imantophyllum cyrtanthiflorum (*fl pi*); I. miniatum (*fl o* and buff); Impatiens Hookeriana (*fl w,* streaked *r*); I. Jerdoniæ (*fl y* and *r*); I. Sultani (*fl r*); I. Walkeri (*fl r*); Isoloma Ceciliæ (*fl pi*); I. hondense (*fl y, r*-hairy); Justicia marmorata (*fol g* and *w*); J. peruviana (*fl v*); J. ventricosa (*fl pi*); Kæmpferia Gilbertii (*fl g,* margined *w*); K. ornata (*fl y* and *o; fol g, p* beneath); Mantisia saltatoria (*fl y* and *p*); Maranta bicolor (*fol gl-g,* blotched *g, pi-p* beneath); M. concinna (*fl y; fol g*); M. Porteana (*fol g,* barred *w, p* beneath); M. sagoriana (*fl g*); Massangea hieroglyphica (*fol g,* banded *v-bk*); M. musaica (*fl w* and *br; fol y-g* and *g*); Momordica Charantia (*fl y*); Nægelia cinnabarina (*fl r*); N. fulgida (*fl r*); N. f. bicolor (*fl r* and *w*); N. Geroltiana (*fl o-r*); N. multiflora (*fl w* or *c*); N. zebrina (*fl o-r*); Nepenthes atrosanguinea (pitchers *r, y,* and *bk*); N. bicalcarata (pitchers); N. coccinea (pitchers *r,* speckled *y*); N. Courtii (pitchers *gy-g,* spotted *r*); N. Dormanniana (pitchers *g,* blotched *r*); N. Hookeriana (pitchers *r* or *g*); N. intermedia (pitchers *g,* spotted *r*); N. Khasiana (*fl g* and *y*; pitchers *g* and *p*); N. Lawrenciana (pitchers *g,* spotted *r*); N. madagascariensis (pitchers *r, c* throat); N. Mastersiana (pitchers *r, p,* and *pi-c*); N. Morganiæ (pitchers *r* and *g*); N. Northiana (pitchers *p* and *bk* spotted); N. Rafflesiana (*fl y* and *br*; pitchers *g-y* and *br*); N. Rajah (pitchers *p*); N. Ratcliffiana (pitchers *g,* spotted *r*); N. rubro-maculata (pitchers *y-g,* spotted *r*); N. sanguinea (pitchers *r*); N. Sedeni (pitchers *g,* freckled *br-r*); N. Veitchii (pitchers); N. Williamsii (pitchers *g,* spotted *r*); Nymphæa Devoniensis (*aq, fl pi-r*); N. Lotus (*aq, fl r* or *w*) and var.; N. stellata (*aq, fl b, sc*) and vars.; N. Sturtevantii (*aq, fl pi*); N. thermalis (*aq, fl w, sc*); Orthosiphon stamineus (*fl l-b*); Ouvirandra fenestralis (*aq, fl g-w; fol g*); Papyrus antiquorum (*aq,* stems and *fol g*);

Stove (Perennials)—*continued.*

Peperomia clusiæfolia (*fol g,* margined *r*); P. maculosa (*fol g*); P. marmorata (*fol* variegated *g* and *w*); P. nummulariæfolia (*fol g*); P. Saundersii (*fol g* and *w*); Peristrophe speciosa (*fl p* and *r-p*); Philodendron grandifolium (*fl* buff, *g, pi,* &c.; *fol g*); P. Mamei (*fl* variegated *g* and *w*); P. Selloum (*fl g* and *w; fol g*); P. Simsii (*fl r*); Phinæa albo-lineata (*fl w*); P. rubida (*fl r*); Pilea microphylla (*fol g*); Pistia Stratiotes (*aq, fol g*); Pitcairnia Andreana (*fl y* and *r*); P. corallina (*fl r,* edged *w*); P. fulgens (*fl r*); P. Karwinskiana (*fl r*); P. muscosa (*fl r*); P. pungens (*fl r*); P. tabulæformis (*fl r*); P. xanthocalyx (*fl y*); P. zeifolia (*fl w* and *r-y*); Plagiolirion Horsmanni (*fl w*); Plumbago rosea (*fl r-pi*); Portea kermesina (*fl b* and *pi*); Pothos celatocaulis (*fol g*); Rhœo discolor (*fl b* or *p; fol g,* or *p* beneath); Ronnbergia Morreniana (*fl b; fol g*); Ruellia Portellæ (*fl pi; fol g, r-p* beneath); R. spectabilis (*fl p-b*); Saccharum ægyptiacum (*fl si; fol gy-g*); Sanchezia longiflora (*fl r-p*); S. nobilis (*fl y* and *r*); S. n. glaucophylla (*fol gl-g,* striped *w* or *y*); Schismatoglottis crispata (*fl g* and *c-w; fol g,* banded *gy*); S. Lavallei purpurea (*fol g* and *gy, r-p* beneath); S. pulchra (*fol gl-g,* spotted *si-g*); S. variegata (*fl gl-g* and *y-g; fol g,* banded *si*); Scutellaria costaricana (*fl p, y-r,* and *y*); S. Lehmanni (*fl r*); S. splendens (*fl r*); Sinningia barbata (*fl w,* marked *r; fol g, r* beneath); S. concinna (*fl p* and *y; fol g,* nerved *r*) and var.; S. conspicua (*fl y,* marked *p*); S. speciosa (*fl v,* &c.; *fol g,* &c.) and vars.; S. Youngiana (*fl v* or *p,* and *y-w; fol g, g-w* below); Siphocampylos betulæfolius (*fl r*); S. glandulosus (*fl pi*); S. Humboldtianus (*fl r*); S. longepedunculatus (*fl p*); Spathiphyllum candidum (*fl w*); S. cannæfolium (*fl w*); S. pictum (*fol g* and *y-g*); Spigelia splendens (*fl r*); Tacca integrifolia (*fl g,* variegated *p* and *y; fol g*); T. pinnatifida (*fl p; fol g*); Thunbergia coccinea (*fl r,* varying to *o-pi*); T. erecta (*fl b, o,* and *y*); T. fragrans (*fl w, sc*); T. laurifolia (*fl b*); Tillandsia carinata (*fl y, r,* and *g*); T. corallina (*fl g* and *p-r*); T. glaucophylla (*fl g-w, p, r,* and *y*); T. Hamaleana (*fl g, w, v,* and *p*); T. ionantha (*fl v*); T. Lindeni (*fl g, r,* and *b-p*); T. Morreni (*fl br* and *y-g*); T. psittacina (*fl g, r,* and *y*); T. pulchra (*fl g-w, w,* and *r*); T. regina (*fl w* and *pi, sc*); T. Saundersii (*fl g-y*); T. splendens (*fl y* and *p; fol g,* zoned *br* beneath); T. umbellata (*fl b, w,* and *g*); T. virginalis (*fl w* and *g*); T. xiphioides (*fl w*); T. xiphostachys (*fl p, g, y,* and *r*); Turnera ulmifolia (*fl y*); Tydæa amabilis (*fl pi,* dotted *p*); Typhonium divaricatum (*fl p*); Utricularia montana (*fl w* and *y*); Xanthosoma Barilleti (*fol g*); X. Lindeni (*fol g,* veined *w*); X. violaceum (*fl v* and *w; fol g*).

TRAILING.—Lists of the best Herbaceous Creepers and Trailers are here given. Many of them will be found useful for growing in baskets; and amongst the hardy kinds, plants for covering exposed parts of the rockery may be readily selected. Those Creepers and Trailers which are of a shrubby nature are classified under the heading **Shrubs.**

Hardy.—ANNUALS.—Blumenbachia insignis (*fl w* and *r-y*); Lagenaria vulgaris (*fl w; fr y*); Limnanthes Douglasii (*fl y,* changing to *w* and *g*); Loasa prostrata (*fl y*); Mesembryanthemum crystallinum (*fl w; fol*); Nolana paradoxa (*fl*); Nonnea rosea (*fl pi* and *y-w*); Silene pendula (*fl pi-w*); Wahlenbergia hederacea (*fl b*).

PERENNIALS.—Ajuga reptans (*fl b,* varying to *pi*); Anagallis tenella (*fl pi*); Androsace lanuginosa (*fl pi*); Arabis albida (*fl w*); A. arenosa (*fl pi, w,* or *b*); A. lucida (*fl w*); A. l. variegata (*fol* edged *y*); A. petræa (*fl w*); A. rosea (*fl pi-p*); Arenaria balearica (*fl w*); A. purpurascens (*fl p*); Astragalus austriacus (*fl b* and *p*); A. glycyphyllos (*fl g-y*); A. hypoglottis (*fl p, b,* and *w*); Centaurea dealbata (*fl pi*); Claytonia sibirica (*fl pi*); Convolvulus cantabricus (*fl r*); Coronilla iberica (*fl y*); Leptinella dioica (*fl y*); Linaria Cymbalaria (*fl b* or *l*);

Trailing (Hardy Perennials)—*continued.*

Lysimachia Nummularia (*fl y*; *fol g*); Mimulus moschatus (*fl y*); Mitchella repens (*fl w* and *p*); Nertera depressa (*fr o* or *r*); Nierembergia rivularis (*fl w* and *y*); Omphalodes verna (*fl b* and *w*); Ourisia coccinea (*fl r*); Oxalis corniculata (*fl y*); O. c. rubra (*fol p*); O. enneaphylla (*fl w* or *pi*, veined *p*); Phlox reptans (*fl p* or *v*); Potentilla ambigua (*fl y*); Pratia angulata (*fl w*); P. repens (*fl w*, tinted *v*); Pyxidanthera barbulata (*fl w* or *pi*); Saponaria ocymoides (*fl r* or *pi*); Saxifraga oppositifolia (*fl p*); Scutellaria or entalis (*fl y*, or *y* and *p*); Sedum album (*fl w*; *fol g*); S. anglicum (*fl w* or *pi*; *fol g*); S. reflexum (*fl y*); Tiarella cordifolia (*fl w*); Trifolium uniflorum (*fl b* and *p*); Tropæolum polyphyllum (*fl y*); Vinca herbacea (*fl p-b*; *fol g*); V. major (*fl b-p*; *fol g*); V. m. elegantissima (*fol g*, marked *w*); V. media (*fl b*); V. minor (*fl v-p*, *w*, or *b*; *fol g*); Waldsteinia fragarioides (*fl y*).

Half-hardy.—Annuals.—Abronia umbellata (*fl pi*, *sc*); Calandrinia Menziesii (*fl p-r*).

Biennial.—Calandrinia umbellata (*fl r*).

Perennials.—Abronia arenaria (*fl y*, *sc*); Boussingaultia baselloides (*fl w*, changing to *bk*); Nierembergia

Trailing (Half-hardy Perennials)—*continued.*

calycina (*fl y* and *w*); Saxifraga sarmentosa (*fl w*, dotted *y* and *r*; *fol r* beneath).

Tender.—Annual.—Ipomœa filicaulis (*i-h*, *fl w* or *c*, and *p*).

Perennials.—Aneilema biflora (*c-h*, *fl b*); Arabis blepharophylla (*c-h*, *fl pi-p*); Batatas edulis (*i-h*, *fl w* and *p*); Begonia amabilis (*i-h*, *fl pi* or *w*; *fol g* or variegated); B. hydrocotylifolia (*i-h*, *fl pi*); B. prismatocarpa (*st*, *fl o* and *y*; *fol g*); Convolvulus mauritanicus (*c-h*, *fl b*, throat *w*, anthers *y*); Cyanotis kewensis (*st*, *fl pi*); Episcia bicolor (*st*, *fl w*, bordered *p*); Fragaria indica (*c-h*, *fl y*; *fr r*); Gazania splendens (*c-h*, *fl o*, marked *bk* and *w*); Kennedya prostrata (*c-h*, *fl r*); Œnothera acaulis (*c-h*, *fl w*, fading to *r*); Œ. taraxacifolia (*c-h*, *fl w*, fading to *r*); Oleandra nodosa (*st*, *fol g*); Pelargonium peltatum (*c-h*, *fl* varying from *w* to *r*); Pellionia Daveauana (*i-h*, *fl g*; *fol g*, tinted *v*); P. pulchra (*i-h*, *fol g*, *bk*, and *p*); Peperomia nummulariæfolia (*st*, *fol g*); Selaginella albonitens (*c-h*, *fol g*); S. apus (*c-h*, *fol g*); S. denticulata (*c-h*, *fol g*, turning *r*); S. Kraussiana (*c-h*, *fol g*); S. Martensii (*c-h*, *fol g*); S. uncinata (*c-h*, *fol g*); Stenotaphrum americanum variegatum (*st*, *fol g*, striped *w*).

COLOURS OF FLOWERS OF HERBACEOUS PLANTS.

AN attempt is here made to classify, under definite headings, according to the colours of their flowers, the most desirable of the herbaceous plants described in this work, with a view to facilitating the selection of plants when blossoms of certain hues are required for any special purpose. Many good, and in some cases popular, subjects are perforce omitted owing to the profusion of tints exhibited by individual flowers (a large number of the Orchids might be cited as examples); but wherever possible, plants whose flowers are not self-coloured are classed under the heading to which their *prevailing* colour most nearly approximates, and their markings briefly indicated.

Where a plant bears flowers in two or more distinct varieties or strains of colour, its name will be found under each—*e.g.*, *Delphinium Ajacis* is classed under Blue, Red, and White. It has not been thought necessary to make provision for the few green-flowered subjects—mostly Orchids—in cultivation, as it is unlikely that such a list would be sought by any reader.

The height of each plant is given in feet and fractions of a foot.

The following abbreviations are employed throughout this section of the Supplement:—

aq, aquatic; *b*, blue; *bk*, black; *br*, brown; *c*, cream; *c-h*, cool house; *g*, green; *gl*, glaucous; *gy*, grey; *i-h*, intermediate house; *l*, lilac; *m*, magenta; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *s-aq*, semi-aquatic; *sc*, scented; *si*, silvery; *st*, stove; *v*, violet; *w*, white; *y*, yellow.

Others have, however, been deemed necessary, in order to more clearly indicate the exact shades or tints—*e.g.*, under Pink there are *d* (dark), *fl* (flesh), *pa* (pale), *ro* (rose), and *sa* (salmon)—but, to avoid confusion, the additional abbreviations are confined to the section to which they refer.

BLUE.—The shades are indicated by the following abbreviations: *am* (amethystine), *d* (dark), *pa* (pale), *sk* (sky).

Hardy.—ANNUALS.—Anagallis grandiflora (varying to *r*; ¼); Asperula orientalis (*sk*; 1); Borago longifolia (1); B. officinalis (*b*, *p*, or *w*; 1-2); Centaurea Cyanus (variable; 2-3); Delphinium Ajacis (*b*, *r*, or *w*; 1-1½); Gilia achilleæfolia (*p-b*; 1); G. capitata (1-2); Moricandia sonchifolia (*pa v-b*; 1-2); Nemophila insignis (*sk*; 1½); N. Menziesii

Blue (Hardy)—*continued.*

vars. (*pa*; ¼); Nicandra physaloides (2); Nigella damascena (*b* or *w*; 1-2); N. hispanica (*d*; 1-2); Nolana tenella (*pa*); Phacelia campanularia (*d*, spotted *w*; ½-¾); P. viscida (*p-b*; 1); P. Whitlavia (2); Sedum cœruleum (¼); Wahlenbergia hederacea (*pa*).

BIENNIALS.—Anarrhinum bellidifolium (*pa*, or *w*; 2); Myosotis sylvatica (throat *y*; 1-2).

PERENNIALS.—Aconitum angustifolium (*d*; 2-3);

Blue (Hardy Perennials)—*continued.*

A. biflorum (*pa*; ½); A. chinense (*d*; 4-6); A. eminens (2-4); A. gracile (*pa*, or *v*; 2); A. Napellus (3-4); A. Ottonianum (variegated *w*; 2-4); A. tauricum (*d*; 3-4); A. variegatum (1-6); A. vulparia septentrionale (4); Actæa spicata (*pa*, or *w*; 1) and var.; Adenophora coronopifolia (1-2); A. denticulata (1½); A. Fischeri (1½); A. Lamarckii (1-2); A. pereskiæfolia (1½); A. stylosa (*pa*; 1-1½); A. verticillata (*pa*; 2-3); Ajuga orientalis (1-1½); A. pyramidalis (*b* or *p*; ½); Allium azureum (*sk*; 1-2); A. cœruleum (¾); Amphicome salicifolia (*pa*; 1½-2½); A. Tabernæmontana (*pa*; 1½-2½); Anemone angulosa (*sk*; ¾-1); A. apennina (½); A. blanda (*d*; ½); A. Hepatica vars. (½); A. nemorosa cœrulea (½); A. n. Robinsoniana (*sk*; ½); Aphyllanthus monspeliensis (1); Aster æstivus (2); A. elegans (2); A. lævis (2); A. novæ-belgii (*pa*; 4); A. paniculatus (*pa*; 4); A. spectabilis (2); Astragalus arenarius (½); A. austriacus (*b* and *p*; ¼); Baptisia australis (2); B. exaltata (*d*; 3-4); Borago laxiflora (*pa*); Brodiæa capitata (*v-b*; 1-2); B. congesta (1); Calophanes oblongifolia (1); Camassia esculenta (*d*, varying to *w*; 1½); C. Fraseri (*pa*; 1); Campanula Allionii (rarely *w*; ¼); C. alpina (*d*; ¼-¾); C. barbata (*pa*; ½-1½); C. betonicæfolia (*p-b*; 1½); C. cæspitosa (*d*; ¼-½); C. carpathica (¾); C. cenisia (*d*; ¼); C. collina (*d*; 1); C. garganica (¼-½); C. grandis (*pa v-b*; 1-2); C. isophylla (*l-b*); C. lactiflora (*b* or *c*; 2-6); C. latifolia macrantha (*p-b*; 1-2); C. nitida (*b* or *w*; ¼-¾); C. persicæfolia cærulea coronata (1-3); C. primulæfolia vars. (1-3); C. pulla (*v-b*; ¼-½); C. pusilla (*d*, varying to *w*; ¼-½); C. pyramidalis vars. (4-5); C. Rapunculus (*b* or *w*; 2-3); C. rotundifolia (*d*; ½-1); C. r. Hostii (½-1); C. r. soldanellæflora (1); C. sarmatica (*pa*; 1-2); C. Scheuchzeri (*d*; ¼-½); C. speciosa (*b*, *w*, or *p*; 1-1½); C. Tommasiniana (*pa*; ¾-1); C. Trachelium vars. (2-3); C. Van Houttei (*d*; 2); C. Waldsteiniana (*v-b*; ¼-½); C. Zoysii (*pa*; ¼); Centaurea montana (2); Chionodoxa Luciliæ (*d*, *w* centre; ½); Clematis aromatica (*v-b*; 4-6); Commelina virginica; Delphinium cashmirianum (*pa*; 1-1½); D. dasycarpum (petals *br*; 4-6); D. exaltatum (*b* or *w*; 3-6); D. formosum (1½-3); D. grandiflorum (varying to *w*; 1-2); Dracocephalum altaiense (½-¾); D. austriacum (1½); D. peregrinum (¼); D. speciosum (*pi-b*; 1½); Eryngium alpinum (1½-2); E. amethystinum (*am*; 1-2); E. Bourgati (1-2); E. giganteum (3-4); Fritillaria persica (*v-b*; 3); F. tulipifolia (1); Galega officinalis (3-4); G. orientalis (2-4); Gentiana acaulis (marked *y*; ¼); G. affinis (¼-1); G. Andrewsii (1-2); G. asclepiadea (½-1½); G. bavarica (*d*; ¼); G. cruciata (*pa*, throat dotted *g*; ½); G. Kurroo (*sk*, sprinkled *w*); G. ornata (*d*, tube striped *w*; ½); G. Pneumonanthe (*d*; ½-1); G. pyrenaica (*d*, *pa g* outside; ¼); G. septemfida (*sk*; ½-1½); G. verna (*sk*; ½); Geranium ibericum (1); G. pratense (2-3); G. sylvaticum (*b* or *p*, veined *r*); ¾); Globularia nudicaulis (½); G. vulgaris (½-1); Glycyrrhiza glabra (3-4); Houstonia cærulea (*pa*; ¼); Hyacinthus amethystinus (¼-1); H. varieties (*sc*; ¾-1); Iris sibiricus (*l-b* and *v*; 1-2½); Lactuca alpina (*p-b*; 3); L. tuberosa (*pa*; 1-1½); Linaria Cymbalaria (*b* or *l*); Linum alpinum (½); L. narbonense (2); Lithospermum Gastoni (*sk*, 1-1½); L. purpureo-cæruleum (*r* at first; 1); Lobelia syphilitica (*pa*; 1-2); Lophanthus anisatus (3); Lupinus lepidus (*p-b*, *w* spot; ½); L. nootkatensis (mixed *p*, *w*, or *y*; 1-1½); L. perennis (2); L. polyphyllus (usually *d*; 4); L. subcarnosus (*d*; 1); Mandragora vernalis (*b* or *w*; 1); Mertensia alpina (*pa*; ½-¾); M. lanceolata (½-1); M. sibirica (*p-b*, &c.; ½-1½); M. virginica (*p-b*; 1-2); Muscari botryoides (*d sk*; ½-1); M. b. pallidum (*pa* ½-1); M. Elwesii (¼); M. Heldreichii (¾); M. neglectum (*d*, *sc*; ¾-1); M. paradoxum (*b-bk*; ½-¾); M. racemosum (*d*, changing to *r-p*, *sc*; ¼-¾); M. Szovitsianum (*sc*; ½); Myosotis alpestris (*y* eye, *sc*; ¼); M. dissitiflora (*d sk*; ½-1); M. palustris (*s-aq*, throat *y*; ½-1); M. sylvatica (throat *y*; 1-2); Omphalodes Luciliæ (*l-b*; ¼-½); O. verna (throat *w*; ½); Oxytropis montana (calyx *p*; ½); O. pyrenaica (*sk*; ¼-½); Pentstemon azureus (*sk*; 1); P. glaber (*b*, *p*, or *v*, ½-1); P. varieties; Phlox divaricata (*b* or *pa l*; ¾-1¼); Phyteuma comosum (*b* or *p*, ¼-½); P. humile (*b*; ¼); Pinguicula grandiflora (*s-aq*, *v-b*); Platycodon grandiflorum (½-1); Polemonium cæruleum (2); P. confertum (½); P. humile (*b* or *p*; ½); P. reptans (*b* or *w*; ½); Primula capitata (*v-b*); P. sapphirina (*pa*; ½); Pulmonaria angustifolia (at first *pi*; 1); Salvia hians (2); Scabiosa caucasica (*pa*; 1); Scilla amœna (*b* or *w*; ½-¾); S. bifolia (*b*, *r*, or *w*; ½); S. hispanica (often turning *pi-p* or *w*); ¾-1); S. h. aperta (*pa*; ¾-1); S. nutans vars.; S. pratensis; S. sibirica (*d*; ¼-½); Statice elata (2); S. floribunda (*v-b*); S. latifolia (1); Symphytum caucasicum (3); Veronica incana (2); V. spicata (½-1½); V. virginica (*b* or *w*; 2-6); Vinca media; V. minor vars.; Viola cornuta (*pa*); V. odorata vars. (*sc*); V. pedata (*b* or *w*); V. rothomagensis (striped *bk*); V. tricolor vars.; Wahlenbergia Kitaibelii (tinged *p*; ½); W. tenuifolia (*v-b*, *w* at base; ¼-½); Wulfenia carinthiaca (1-2).

Half-hardy.—Annuals.—Ageratum mexicanum (*l-b*; 2) and vars.; Brachycome iberidifolia (*b* or *w*; 1); Callistephus chinensis vars. (½-2); Downingia elegans (*w* streak; ½); D. pulchella (*y* eye; ½); Ipomœa hederacea (*pa*; 10); Swertia corymbosa (*pa*, or *w* and *b*; ¾-1½).

Perennials.—Anagallis linifolia (¾-1) and vars.; Bellis rotundifolia cærulescens (*pa*, or *w*); Calotis cuneifolia (1); Cœlestina ageratoides (1); Commelina cœlestis (1½); Dianella lævis (2); D. tasmanica (*pa*, 3-5); Herbertia cærulea (claws *w*; ½); Heteranthera limosa (*s-aq*, *v-b*); Myosotis azorica (*y* eye; ½-¾); Salvia patens (2½); Triteleia laxa (1-1½); Verbena venosa (*b* or *l*; 2); Viola hederacea (*b* or rarely *w*).

Tender.—Annuals.—Browallia demissa (*c-h*, *pa*; ½-1); B. elata (*c-h*, *d*; 1½); B. e. grandiflora (*c-h*, *pa*; 1½); Coccocypselum repens (*st*); Solanum Melongena (*c-h*; 2-8); S. sisymbriifolium (*c-h*, *pa*, or *w*; 4); Torenia asiatica (*st*, lateral lobes *d v*).

Biennials.—Anchusa capensis (*c-h*; 1½); Blepharis capensis (*c-h*; 1); Echium candicans (*c-h*, 2-4).

Perennials.—Æchmea cœlestis (*st*, *sk*); Aganisia cærulea (*st*); Agapanthus umbellatus (*c-h*; 2-3); A. u. flore-pleno (*c-h*); A. u. Leichtlinii (*c-h*, *da*); A. u. maximus (*c-h*); A. u. minor (*c-h*, *da*); A. u. Mooreanus (*c-h*, *da*); Agathæa cœlestis (*c-h*; 1½); Aneilema biflora (*c-h*; ¼); Angelonia salicariæfolia (*st*; 1½-3); Anthurium acaule (*st*; 1-3); Babiana disticha (*c-h*, *pa*, *sc*; ½); B. plicata (*c-h*, *v-b*, *sc*; ½); Bæa hygrometrica (*c-h*, *pa*; ½); Billbergia marmorata (*st*, *d*, bracts *r*); B. rosea marginata (*st*, *pa*, bracts *pi*; 1½); Chirita lilacina (*st*, *pa*, tube *w*); Cineraria varieties (*c-h*); Convolvulus mauriticanus (*c-h*, throat *w*); Cyanella odoratissima orchidiformis (*c-h*, *sc*; 1); Dendrobium MacCarthiæ (*st*, cerise-*b*, lip veined *p*; 1½-2); Dichorisandra musaica (*st*, *sk*; 1½); D. thyrsiflora (*st*, *d*, anthers *y*; 4); Geissorhiza Rochensis (*c-h*, spotted *r*; ¾); Gentiana Fortunei (*c-h*, *d*, spotted *w*; ½); Gloxinia varieties (*st*); Griffinia hyacinthina (*i-h*, *w* at base; ¾); Hyacinthus varieties (*c-h*, *sc*, ¾-1); Lachenalia purpureo-cærulea (*c-h*, *p-b*; ½-¾); Lobelia Erinus (*c-h*, throat *w* or *y*; ½); Nymphæa gigantea (*i-h aq*, stamens *y*); N. scutifolia (*i-h aq*, *sc*); N. stellata (*st aq*, *sc*); N. s. zanzibarensis (*st aq*, *d*); Orthosiphon stamineus (*st*, *pa l-b*; 2); Portea kermesina (*st*, bracts *pi*; 1½); Rhœo discolor (*st*, *b* or *p*); Ronnbergia Morreniana (*st*); Ruellia spectabilis (*st*, *p-b*, *d* veined; 2); Saccolabium cœleste (*st*); Salvia cacaliæfolia (*c-h*, *d*; 3); Solanum sisymbriifolium (*c-h*, *pa*, or *w*; 4); Stokesia cyanea (*c-h*, 1-1½); Streptocarpus Rexii (*i-h*; ½); S. Saundersii (*i-h*, *pa*; 1); Thunbergia erecta (*st*, *d*, *o* and *y* below; 6); T. laurifolia (*st*); Tillandsia umbellata (*st*, centre *w*; 1); Tropæolum azureum (*c-h*, *sk*); Vanda cærulea (*st*; 2-3); Wigandia Vigieri (*c-h*, *l-b*; 6).

BROWN.—The shades are indicated by the following abbreviations: *cho* (chocolate), *d* (dark), *pa* (pale).

Brown—*continued.*

Hardy.—PERENNIALS.—Aira flexuosa (1); Aplectrum hyemale (*g-br*; 1); Arisæma triphylla (*p-br* and *g*; ¾-1); Asarum canadense (1); Cheiranthus Cheiri vars. (*sc*; 1-2); Dracunculus vulgaris (3); Fritillaria græca (½); Geranium phæum (*bk-br*, spotted *w*); Helicodiceros crinitus (*p-br*; 1-1½); Iris fulva (2-3); Primula Auricula vars. (¼); P. officinalis vars. (¼-1).

Half-Hardy.—PERENNIALS.—Calceolaria varieties (1); Eucomis nana (¾); Ferraria Ferrariola (*y-br*; ½).

Tender.—PERENNIALS.—Amomum Cardamomum (*st*; 8); Bulbophyllum barbigerum (*st*, *g-br*; ½); Cattleya guttata Leopoldii (*st*, *d*, spotted *r*, lip *r-p*; 1½-2); Colocasia indica (*st*; 5); Cymbidium Devonianum (*st*, *pa*, marked *mv-p*, lip *p* and *w*; 1½); C. giganteum (*st*, lip marked *y* and *p*; 2½); C. Huttoni (*st*, *cho* and *w*); Dracontium asperum (*st*, *p-br*; 5-6); Houlletia picta (*st*, column *y*); Hypolytrum latifolium (*st*; 2-4); Masdevallia ephippium (*c-h*, *p-br*, marked *y*, *y* tails); Odontoglossum tripudians (*c-h*, marked *y-g*); Oncidium annulare (*i-h*, marked *y*); O. bicallosum (*st*, *d*, lip *y*); O. cucullatum (*c-h*, *p-br*); Vanda insignis (*st*, lip *w* and *p-pi*); Zygopetalum Clayi (*i-h*, *p-br*, lip *p*).

LAVENDER, LILAC, AND MAUVE.—The shades are indicated by the following abbreviations: *d* (dark); *la* (lavender); *pa* (pale).

Hardy.—ANNUALS.—Gilia androsacea (*l*, *pi*, or nearly *w*; ¾-1); G. densiflora (*l* or nearly *w*; ¾); Ionopsidium acaule (*l*, or *w* tinged *v*; ¼); Lunaria annua (*v-l*; 1½-3); Lupinus nanus (*l* and *b*; 1); Malcolmia maritima vars. (½-1); Papaver somniferum vars. (3-4); Statice Suworowi (*l*).

BIENNIALS.—Aquilegia glandulosa (*l-b*, petals *w*; ¾-6); Aster Bigelovii (*l*, disk *y*; 2½); Lunaria annua (*v-l*; 1½-3).

PERENNIALS.—Aconitum uncinatum (*l*; 4-8); Æthionema coridifolium (*pi-l*; ½); Anemonopsis macrophylla (*l* and *p*; 2-3); Aquilegia olympica (*mv-b*, petals *w*; 1½); A. pyrenaica (*l-b*; ¾-1); A. sibirica (*l*; 1); Armeria vulgaris (*l*, variable; ½-1); Asclepias Douglasii (*p-l*, *sc*; 2-3); Aster pyrenæus (*l-b*, disk *y*; 1-1½); Campanula carpathica pelviformis (*l*, *sc*; ¾-1½); C. c. turbinata Hendersoni (*mv*; 1); Chrysanthemum varieties; Convolvulus althæoides (*l* or *pa r*); Coris monspeliensis (*l*; ½); Crocus biflorus (*pa la*, varying to *w*; ½); C. speciosus (*l*, striped *p*); C. vernus (*l*, *v*, or *w*; ½); C. varieties; Dahlia varieties; Dodecatheon Meadia (*l*, *pi-p*, or *w*; ¾-1¼); Fritillaria Hookeri (*pa*; ½); Funkia ovata (*b-l* or *w*; 1-1½); Geranium Lamberti (*l*; ¼); G. maculatum (*pa l*; 1½); Haberlea rhodopensis (*pa l*; ¼-½); Hyacinthus varieties (*l* and *mv*; ¾-1); Iris cretensis (*l*; ¾); I. cristata (*l*, marked *y*; ½); I. fœtidissima (*s-aq*, *b-l*; 2-3); I. Histrio (*l* and *p*); I. neglecta (*l* and *w*; 1½-2); I. nepalensis (*l*; ½-1); I. tectorum (*l* and *w*; 1 or more); I. unguicularis (♔, keeled *y*); Lilium roseum (*l*; 1½); Linaria Cymbalaria (*l* or *b*); Merendera Bulbocodium (*pi-l*; ¼); Phlomis cashmeriana (*pa l*; 2); Phlox divaricata (*pa l* or *b*; ¾-1¼); P. varieties (*l* and *mv*); Primula Allionii (*mv*, *w* eye); P. altaica (*mv* or *p-r*, *y* centre; ¼-½); P. denticulata (*l*; ¾-1); P. d. pulcherrima (*d l*; ¾-1); P. japonica vars. (*l*; 1-1½); P. obconica (*pa l* or *p*; ½-1); P. sinensis (*pa l* or *w*; ¾); Salvia carduacea (*la*; 1); Saponaria officinalis (*l* or *w*; 1-3); Saxifraga oppositifolia pyrenaica; S. superba (*pi-l*); Scabiosa amœna (*l* or *pi*; 2-3); Scilla hyacinthoides (*b-l*; 1½-3½); S. peruviana (*l*, *r*, or *w*; 1-1½); Veronica longifolia (*l*; 2); Viola odorata vars. (*la*, *sc*).

Half-hardy.—ANNUALS.—Callistephus chinensis vars. (½-2); Schizanthus Grahami (*l* or *pi*; 2); Verbena varieties (*mv*).

PERENNIALS.—Gladiolus varieties (*l* and *mv*; 1-3); Ophiopogon japonicus intermedius (*l*; 1½); Petunia varieties (*l* and *mv*); Triteleia uniflora (*pa l*; 1); Verbena venosa (*l* or *b*; 2).

Lavender, Lilac, and Mauve—*continued.*

Tender.—ANNUAL.—Browallia grandiflora (*c-h*, *pa l* or *w*; 1-3).

PERENNIALS.—Achimenes Kleei (*i-h*, *l*, marked *y*; ½); A. multiflora (*i-h*, *l*; 1); Barkeria Lindleyana Centeræ (*c-h*, *pi-l*, lip blotched *p*; 2); B. melanocaulon (*c-h*, *pi-l*, lip *r-p* and *g*; 1); B. spectabilis (*c-h*, *pi-l*, lip marked *p* and *r*; 1); Calanthe Dominyi (*st*, *l*, lip *d p*; 1); Calochortus cœruleus (*c-h*, *l*, marked *d b*; ¼-½); C. Gunnisoni (*c-h*, *pa l*, *y-g*, and *p*); C. splendens (*c-h*, *l*; 1½); Didymocarpus primulæfolia (*st*, *l*; ¼-½); Epidendrum nemorale (*st*, *mv* or *pi-l*, lip striped *v*); Episcia chontalensis (*st*, *l*, *y* centre; ½); Gladiolus varieties (*c-h*; 1-3); Gloxinia varieties (*st*); Griffinia dryades (*i-h*, *p-l*, *w* centre; 1½); G. ornata (*i-h*, *b-l*; 1-1½); Hyacinthus varieties (*c-h*, *l* and *mv*, *sc*; ¾-1); Ixia capillaris (*c-h*, *l* or *pi*; 1½); Lachenalia lilacina (*c-h*; ¼-½); Lælia anceps (*c-h*, *pi-l*, lip *p* and *l*, *sc*; 1½); L. majalis (*c-h*, *l*, lip marked *r-p* and *w*; ¾); Nierembergia filicaulis (*c-h*, *y* centre; ½-1); Odontoglossum Cervantesii (*i-h*, *pi-l*, barred *r-br* at base); Podolepis gracilis (*c-h*, *l*, *p*, or *w*; 3); Pogonia Gammieana (*i-h*, *pa l*, *pi*, and *g*); Pterodiscus speciosus (*c-h*, *l* or *r*; 2); Sparaxis pendula (*c-h*, *l*; 4); Wahlenbergia saxicola (*c-h*, *pa l*; ¼-¾); Wigandia macrophylla (*c-h*; 10).

LILAC. *See* **Lavender, Lilac, and Mauve.**

MAUVE. *See* **Lavender, Lilac, and Mauve.**

PINK.—The shades are indicated by the following abbreviations: *d* (dark), *fl* (flesh), *pa* (pale), *ro* (rose), *sa* (salmon).

Hardy.—ANNUALS.—Agrostemma cœli-rosa (*pi* or *w*; 1); Armeria cephalotes (*ro* or *r*; 1-1½); Campanula Erinus (*b-pi*; ¼-¾); Centaurea Cyanus (varying to *b* and *w*; 2-3); Clarkia elegans vars. (2); Gilia androsacea rosacea (*ro*; ¾-1); G. micrantha (*ro*; ¾); Iberis umbellata carnea (*pa* or *fl*; ½-1); Lathyrus grandiflorus (*ro*); Linum grandiflorum (½-1); Malcolmia maritima vars. (*ro*; ½-1); Nonnea rosea (throat *y-w*; ½-1); Œnothera amœna (*ro*, spotted *r*; 1-2); Papaver somniferum vars. (3-4); Sabbatia campestris (*s-aq*, *ro*; 1); Saponaria calabrica (*ro*; ½-1); Silene Atocion; ½-1); S. pendula (*fl*); S. p. compacta (¼).

BIENNIALS.—Althæa caribæa (*ro*, *y* base; 3); A. rosea (*ro*, &c.; 8).

PERENNIALS.—Acantholimon glumaceum (*ro*; ½); A. venustum (*ro*; ½-¾); Acanthus longifolius (*pi* or *p*; 3-4½); A. mollis (*pi* or *w*; 3-4) and var.; A. spinosissimus (3½); Achillea asplenifolia (*ro*; 1½); A. Millefolium roseum (*ro*; 1-3); Acis roseus (*ro*; ½); Aconitum japonicum (*fl*; 6); Æthionema grandiflorum (*ro*; 1½); Alisma Plantago (*aq*, *pa ro*); Allium acuminatum (*d ro*; ½-¾); A. Bidwelliæ (*ro*; ¼); A. Breweri (*d ro*; ¼); A. falcifolium (*pa ro*; ¼); A. roseum (*l-ro*; 1-1½); Alstrœmeria chilensis (*pi* or *r*, marked *y*; 2-3); Althæa cannabina (*ro*; 5-6); Anagallis tenella (*s-aq*; ½); Androsace Laggeri (½); Anemone japonica elegans (*pa ro*; 2-3); A. nemorosa rosea (*ro*; ½); Antennaria dioica (¼); Anthyllis montana (*pi* or *p*; ½-½); Arabis arenosa (*ro*, rarely *w* or *p*; ½); Armeria dianthoides (*pa*; ½); A. juncea (*ro*; ¼); A. juniperifolia (*d ro*; ½); A. plantaginea (*ro*; 1); A. setacea (*pa ro*; ¼); A. vulgaris Laucheana (*da*; ½-1); Asperula montana (½-¾); Aster longifolius formosus (1½-2); A. novæ-angliæ rubra (*da*; 6); A. pendulus (*ro*, at first *w*; 2); Astilbe rubra (*ro*; 4-6); Astragalus pannosus (½-¾); Astrantia helleborifolia (1); A. major (1-2); Bellis perennis var. (½); Boltonia asteroides (*fl*; 2); B. glastifolia (1½); Butomus umbellatus (*aq*, *ro*); Calystegia pubescens flore-pleno (*fl*, turning *ro*); Centaurea dealbata (*ro*; 1-1½); Chrysanthemum varieties; Claytonia sibirica (*ro*; ½-½); Clintonia Andrewsiana (*d ro*; 2); Colchicum byzantinum (*pa ro*; ½); Corydalis Kolpakowskiana (*pi* or *p*; ½); Cynanchum roseum (*pi-r*; 1-1½); Dahlia varieties; Dianthus alpinus (*d ro*, spotted *r*; ½); D. cæsius (*ro*, *sc*; ½-½); D. Caryophyllus vars. (*sc*; 1½-2); D. deltoides (*ro*; ½-¾); D. fimbriatus (*ro*; 1); D. Fischeri

Pink (Hardy Perennials)—*continued.*

(*ro*; 1); D. neglectus (*d ro*; ½); D. superbus (*ro, sc*; ¾-1½); Dodecatheon Meadia lancifolium (*y* at base; ¾-1½); Douglasia nivalis (¼); Drypis spinosa (*pa pi* or *w*; ½); Echinacea angustifolia (*ro* or *pa p*; 2-4); Epilobium Dodonæi (*d ro*; 1); E. hirsutum (*pa pi* or *w*; 3-5); Eremurus robustus (peach; 8-9); Erythræa diffusa (*d ro*; ¼); E. Muhlenbergi (*d, g-w* star; ¾); Erythronium dens-canis (*p-pi* or *w*; ½); Fritillaria macrophylla (3); Geranium striatum (*d* veins; ¼); Habenaria psychodes (*ro*, varying to *r*); Helianthemum vulgare vars.; Hesperis matronalis vars. (*sc*; 2-3); Hyacinthus corymbosus (*l-ro*; ¼-½); H. varieties (*sc*; ¾-1); Incarvillea Olgæ (*ro*; 3-4½); Lathyrus roseus (*ro*); L. rotundifolius; L. sylvestris platyphyllus (*ro*); Lavatera trimestris (*ro*; 3-6); Lilium speciosum roseum (*ro*; 1-3); Lupinus leucophyllus (2-3); Lychnis alpina (½); L. diurna (*p-pi*; 1-3); L. Lagascæ (*ro, w* centre; ¼); L. pyrenaica (*pa fl*; ¼); L. Viscaria (*ro*; 1); Malva moschata (*ro*; 2-2½); Mimulus Lewisii (*ro*; 1); Morina longifolia (*pa*; 2); Nymphæa alba rosea (*aq, ro*); Œnothera californica (varying to *w, y* centre, *sc*; 2); Pæonia albiflora (2-3); P. varieties (*sc*); Papaver alpinum (*ro, y*, or *w*; ½); Pedicularis verticillata (*pi* or *w*; ½-1); Pentstemon breviflorus (*fl* or *y*, striped *pi* within; 3-6); P. campanulatus vars. (1½); P. heterophyllus (*pi* or *pi-p*; 1½); P. varieties; Phlox amœna (*pi, p*, or *w*; ½-1½); P. glaberrima suffruticosa (*ro*; 2); P. pilosa vars. (1-2); P. subulata (*d* centre); P. varieties; Phuopsis stylosa (1); Physostegia virginiana (*fl* or *p*; 1½-4) and var.; Polygonum vaccinifolium (*ro*); Potentilla nitida (*ro*); Primula cortusoides (*d ro*; ½-¾); P. c. Sieboldii (*d ro, w* eye; ¾-1); P. marginata (*v-ro*; ¼); P. minima (*ro* or *w*; ⅛); Pulmonaria saccharata (1); Pyrethrum roseum (*ro*, disk *y*; 1-2) and vars.; Saponaria ocymoides (*pi* or *r*); Saxifraga peltata (*pa pi* or *w*); S. Stracheyi (½-¾); Scabiosa amœna (*ro* or *l*; 2-3); Scilla hispanica carnea (*fl*; ¾-1); S. nutans rosea (*ro*); Scorzonera undulata (*p-ro*; 1-2); Sedum lydium (¼-½); S. spectabile (1½-2); Sempervivum Lamottei (*pa*, filaments *p*; 1); Silene acaulis (rarely *w*; ½); S. Elizabethæ (*ro*, claws *w*; ¾); S. Hookeri (*pa*); S. pennsylvanica (¼-¾); Teucrium Chamædrys (*ro*, lower lip spotted *w* and *r*; ½-1); Trillium grandiflorum (at first *w*; 1-1½); Tulipa varieties; Vicia argentea (keel spotted *bk*; 1).

Half-hardy.—Annuals.—Abronia umbellata (*ro, sc*; ½-2); Acroclinium roseum (1-2); Calandrinia grandiflora (*ro*; 1); Callistephus chinensis vars. (½-2); Gomphrena globosa carnea (1½); Impatiens Balsamina vars. (1-2); Phlox Drummondii vars. (1); Schizanthus Grahami retusus (*d ro*; 2); Verbena varieties; Zinnia elegans varieties (2).

Biennial.—Adlumia cirrhosa (*pa*; 15).

Perennials.—Androsace carnea (*y* eye; ¼); A. Chamæjasme (*y* eye; ¼); A. lanuginosa (*pa ro, y* eye; ½-¾); A. sarmentosa (*ro, w* eye; ¼); A. villosa (*sc*; ¼); Aponogeton spathaceum junceum (*aq, pa*); Caloscordum nerinæflorum (*ro*; ½); Conandron ramondioides (*p* eye, or *w*; ½); Frankoa sonchifolia (2); Gladiolus floribundus (*fl*, varying to *w*; 1); G. varieties (*fl, ro*, &c.; 1-3); Lathræa squamaria (*fl* or *b*, streaked *p* or *d r*; ¼-1); Petunia varieties; Sedum Sieboldi (¾); Statice callicoma (1); Zephyranthes carinata (tube *g*; 1); Z. rosea (*ro, g* below; ½).

Tender.—Annuals.—Drosera peltata (*c-h*; 1); Waitzia nivea (*c-h, pi, w*, or *pa y*; 1½).

Biennials.—Cleome rosea (*st, ro*; 1½); Convolvulus erubescens (*c-h, r-pi*); Humea elegans (*c-h, pi* or *r*; 5-6).

Perennials.—Abronia umbellata (*c-h, ro, sc*; ½-2); Æchmea fasciata (*st*); Aerides affine (*st, ro*; 3); A. roseum (*st, ro*, spotted; 1); A. r. superbum (*st*); Alpinia nutans (*st, sc*; 13); Amomum Melegueta (*st, pa*; 1-2); Amorphophallus Rivieri (*st, g-pi*, &c.); Barkeria elegans (*c-h, d ro*, lip *r*; 2); B. Skinneri (*c-h, d ro*; 1½); B. S. superbum (*c-h, d ro*, lip streaked *y*; 1½); Begonia amabilis (*i-h, pi* or *w*); B. amœna (*i-h, pa ro*); B. Berkeleyi (*i-h, ro*); B. coriacea (*i-h, ro*; ½); B. Evansiana (*i-h, fl*; 2); B. gogoensis (*i-h, pa ro*); B. gracilis (*i-h*; 1-2); B. hydrocotylifolia (*i-h, ro*; 1); B. malabarica (*i-h, ro*; 2); B. manicata (*i-h*; 2); B. natalensis (*i-h, pa ro*; 1½); B. picta (*i-h, pa ro*; ½-1); B. Richardsiana diadema (*i-h, ro*; 1); B. rosæflora (*i-h, ro*; ½); B. semperflorens (*i-h, pi* or *w*; 2); B. socotrana (*i-h, ro*); B. Verschaffeltiana (*i-h, ro*); B. varieties (*i-h*); Billbergia Lietzei (*st, ro*); Bletia florida (*st, pa ro*; 2); Bomarea Carderi (*c-h, ro*, spotted *p-br*); B. Williamsii (*c-h, ro*); Bromelia bracteata (*st*, bracts *r*; 2); Brunsvigia toxicaria (*i-p*; 1); Burlingtonia decora (*st, pi* or *w*, spotted *r*); B. d. picta (*st*, blotched *p*); Calanthe Veitchii (*st*, throat *w*; 3); Calochortus lilacinus (*c-h, pa*; ½-¾); Canna Annæi (*st, sa*; 6); C. Rendatleri (*st, sa-r*; 6-8); Cattleya dolosa (*i-h*, lip marked *y*); C. Dominiana lutea (*i-h, pa*, lip *w* and *y*); C. eldorado (*i-h, pa*, lip marked *p-r* and *o*); C. e. splendens (*i-h, ro*, lip *o, w*, and *v-p*); C. Harrisoniæ (*i-h, ro*, lip tinged *y*; 2); C. intermedia (*i-h, ro* or *ro-p*, lip blotched *v-p*; 1); C. i. superba (*i-h, ro*, lip *p*; 1); C. labiata (*i-h, d ro*, lip *r*; 1½-2); C. l. Pescatorei (*i-h, pa ro*, lip *r*; 1½-2); C. maxima (*i-h, ro*, lip *pa*, marked *p-r* and *o*; 1-1½); C. Mendelli (*i-h, pa*, varying to *w*, lip *m*); C. Mossiæ (*i-h*; 1) and vars; C. Sedeniana (*i-h, pa*, shaded *g*, lip *p* and *w*); C. speciosissima (*i-h, fl*, lip *b, w*, and *y*); C. Trianæ (*i-h*, marked *o* or *y*, and *p*) and vars.; C. Walkeriana (*i-h, ro*, lip tinged *y, sc*; ¼-½); C. Warneri (*i-h, d ro*, lip *d r*); Centropogon fastuosus (*c-h, ro*; 2); Chironia floribunda (*c-h*; 2); Chysis aurea Lemminghei (*st, ro*; 1); Cœlogyne Wallichiana (*i-h, ro*, lip banded *w, sc*; 1); Comparettia macroplectron (*i-h, pa ro*, speckled *r*; ½); Crassula Bolusii (*c-h, pa fl*; ¼-½); Cyanella odoratissima (*c-h, sc*; 1); Cyanotis kewensis (*st, ro*); Dendrobium bigibbum superbum (*c-h, ro*; 1); D. Parishii (*st, ro*; ¾-1); D. Pierardii (*c-h, pa*, or *c*, lip *y* and *p*; D. superbum anosmum (*st, ro*, lip *p*); Epidendrum dichromum (*c-h, pa ro*, lip *r*; 2-3); Gesneran ægelioides (*st, ro*, marbled *r*, throat *y* and *r*); Gladiolus varieties (*c-h*; 1-3); Gloxinia varieties (*st*); Hessea crispa (*c-h*; ¼); Hippeastrum reticulatum (*i-h, pi* and *w*; 1); Hyacinthus varieties (*c-h, sc*; ¾-1); Isoloma Ceciliæ (*st, ro*; 1-1½); Ixia capillaris (*c-h, fl* or *l*; 1½); I. patens (*c-h*; 1); Lælia anceps Leeana (*i-h, ro*, lip *w* and *p, sc*; 1½); L. a. Warnerii (*i-h, ro*, lip *r, sc*; 1½); L. autumnalis (*i-h, ro*, lip *ro-w* and *y, sc*; 1); L. elegans Turneri (*i-h, ro*, lip *m-ro*; ¾); L. præstans (*i-h, d ro*, lip *r-p*); L. superbiens (*i-h, ro*, streaked *r*, lip *r* and *y*; 5); L. Wallisii (*i-h, ro*, lip marked *y*); Lotus australis (*c-h*, variable; 2); L. gebelia (*c-h, ro*); Miltonia Regnelli (*st, pa ro*; 1); M. vexillaria (*st, ro* and *w*); Nerine flexuosa excellens (*c-h, ro*, ribbed *r*; 1); N. f. pulchella (*c-h, pa*, striped *r*; 2); N. sarniensis (*c-h, pa sa*; 2-2½); N. undulata (*c-h, fl*; 1); Nymphæa Sturtevantii (*st aq*); Oxalis rosea (*c-h, ro*; ½-1); Pelargonium fissum (*c-h, pa*; 1); P. varieties (*c-h*); Phalænopsis Esmeralda (*st*; 1); P. Sanderiana (*st, ro*, lip *w, br, p*, and *y*); P. Schilleriana (*st, ro*, centre of lip *w* and *y*); Primula mollis (*c-h, ro* and *r*; 1-1½); Rivina humilis (*st, pa ro*; 1-2); R. lævis (*st, pa ro*; 7-8); Romulea speciosa (*c-h, ro*, striped *v* and *y* at base; ½); Ruellia Portellæ (*st, ro*; 1); Saccolabium rubrum (*st, d ro*; ¾); Satyrium nepalense (*c-h, ro*; 1); Sedum Ewersii (*c-h, pi* or *pa v*; ½); S. Sieboldi (*c-h*; ¾); Siphocampylos glandulosus (*st, ro*; 3); Spathoglottis rosea (*st, ro*); Streptocarpus Dunnii (*c-h, ro*, tinged *r*; 1); Stylidium graminifolium (*c-h*; ½-1½); Swainsona Greyana (*c-h*; 2-3); Tydæa amabilis (*st, d ro*, spotted *p*; 1-2); Watsonia rosea (*c-h, ro*; 2).

Pink (Tender Perennials)—*continued.*

PURPLE AND VIOLET. — The shades are indicated by the abbreviations *d* (dark) and *pa* (pale).

Hardy. — Annuals. — Æthionema saxatilis (*p*; ½); Agrostemma cœli-rosa purpurea (*p*; 1); Amarantus caudatus (*d p*; 2-3); Borago officinalis (*p, b*, or *w*; 1-2); Cerinthe retorta (*p*, tube *y*; 1½); Clarkia pulchella (*p*; 1½-2); Collinsia grandiflora (*p*; 1); Eucharidium concin-

Purple and Violet (Hardy Annuals)—*continued.*

num (*l-p*; 1); Gilia tricolor vars. (*v*; 1); Iberis umbellata (*p*; ½-1) and vars.; Impatiens amphorata (*p*, marked *pi-r*; 3-6); I. Roylei (*p*; 10); Ipomœa purpurea (*p*); Lathyrus odoratus vars. (*p* and *v*, *sc*); Linaria bipartita (*v-p*; 1); L. reticulata (*d p*; 2-4); Lopezia coronata (*pi-p*; 1½); Malope trifida (*p* or *w*; 1); Mathiola annua vars. (1-2); Œnothera amœna rubicunda (*l-p*, blotched; 2); Papaver somniferum vars. (*v*; 3-4); Polygonum orientale (*pi-p* or *w*; 3-10); Scabiosa atropurpurea vars. (*sc*; 2-3); Sedum farinosum (*pa r-p*); Vicia onobrychioides (*p*; 2); Xeranthemum annuum (*p*; 2).

BIENNIALS.—Campanula sibirica divergens (*v*; 1½); Digitalis purpurea (*p*, varying to *w*; 3-5); Hesperis grandiflora vars. (*p*, *sc*; 4); H. tristis vars. (*d p*, *sc*; 1-2); Silybum Marianum (*pi-p*; 1-4); Tragopogon glaber (*p*; 1½).

PERENNIALS.—Acanthus longifolius (*p* or *pi*; 3-4½); Aconitum autumnale (*b-p*; 3-4); A. delphinifolium (*b-p*; ½-2); A. Halleri (*v*; 4-6); A. lycoctonum (*v*; 4-6); A. paniculatum (*v*; 2-3); A. rostratum (*v*; 1-2); A. Willdenovii (*b-p*; 2-3); Agrostemma flos-Jovis (*p* or *r*; 1½); Ajuga pyramidalis (*p* or *b*; ½); Allium Murrayanum (*pi-p*; 1); A. nigrum (*v* or *w*; 2½-3¼); A. pedemontanum (*pi-p*; 1); Anemone Halleri (*p*; ½); A. patens (*p* or *y*; 1); A. p. Nuttalliana (*p* or *c*; 1); A. pratensis (*d p*; ½-1); A. Pulsatilla (*v*; ½-1); A. ranunculoides, Pyrenean var. (*p*; ½); A. stellata (*p*, *pi-r*, or *w*; ¾); A. virginiana (*pa p* or *g-p*; 2); Anthyllis montana (*p* or *pi*; ¼-½); Antirrhinum tortuosum (*p*; 1-1½); Apios tuberosa (*br-p*, *sc*); Aquilegia Bertoloni (*b-v*; 1); Arabis blepharophylla (*pi-p*; ½); A. rosea (*pi-p*; 1); Arenaria purpurascens (*p*; ½); Arethusa bulbosa (*pi-p*; ¾); Arisæma Griffithii (*br-v*; 1-1½); Arum proboscideum (*g-p*; ½); Asclepias amœna (*p*, corona *r*; 2-3); A. incarnata (*p* or *r*; 2); A. syriaca (*pa p*, *sc*; 3-5); Aster alpinus (*p*; ½-¾); A. altaicus (*b-p*; 1); A. Amellus (*p*; 2); A. A. Bessarabicus (*p*; 2½); A. argenteus (*p*; 1); A. caucasicus (*p*; 1); A. concinnus (*p*; 2); A. Douglasii (*p*; 3-4); A. floribundus (*pa p*; 4); A. grandiflorus (*p*; 2); A. novæ-angliæ (*p*; 6); A. peregrinus (*b-p*; 1); A. pulchellus (*p*; 1); A. salsuginosus (*v-p*; ¾-1½); A. s. elatior (*v-p*; 2); A. sikkimensis (*p*; 3); A. versicolor (*p*, at first *w*; 3); Astragalus adsurgens (*b-p*; ½); A. onobrychioides (*p*; ¾-1); A. sulcatus (*pa v*, marked *br* and *w*; 2-3); Berkheya purpurea (*p*; 3); Biarum tenuifolium (*d br-p*; ½); Bletia hyacinthina (*p*; 1); Brodiæa grandiflora (*b-p*; 1½); B. Howellii (*b-p*; 1½-2); B. multiflora (*b-p*; 1-1½); Bulbocodium vernum (*v-p*, spotted *w*; ½); Calamintha grandiflora (*p*; 1); Callirhoe digitata (*r-p*; 2-3); Calopogon pulchellus (*p*, lip bearded *y*; 1½); Calystegia dahurica (*pi-p*); Campanula bononiensis (*b-v*; 2-3); C. Burghalti (*pa p*; 2); C. carpathica pallida (*pa p*; ½-1); C. c. turbinata (*d p*; ½-1); C. Elatines (*b-p*; ½-1); C. fragilis (*l-p*; ¼-½); C. glomerata (*b-v* or *w*; 1-2); C. nobilis (*r-v* or *w*; 2); C. peregrina (*v*; 2); C. Portenschlagiana (*pa b-p*; ½-¾); C. rapunculoides (*b-v*; 2-4); C. speciosa (*p*, *b*, or *w*; 1-1½); Cardamine pratensis (*pa p*; 1-1½); C. rhomboidea-purpurea (*pi-p*); Cedronella cordata (*pa p*; ¼-½); Centaurea atropurpurea (*d p*; 3); Chelone Lyoni (*p*; 3-4); C. nemorosa (*pi-p*; 1); C. obliqua (*pa p*; 2-3); Chrysanthemum varieties; Cnicus acaulis (*p*; 2); C. altissimus (*p*; 3-10); C. undulatus (*p*; 1); Colchicum autumnale (*p*; ¼) and vars.; C. Bivonæ (checkered *p* and *w*); C. montanum (*l-p* or *w*; ¼); C. Parkinsoni (tessellated *p* and *w*); Convolvulus lineatus (*r-p*; ½); Corydalis cava (*p*; ½); C. Kolpakowskiana (*p* or *pi*; ½); C. solida (*p*; ½); Crocus Imperati (*l-p*, *sc*; ¼-½); C. iridiflorus (*p*, inner segments *l*; ¼); C. nudiflorus (*pa p* or *v*; ½); C. vernus (*v*, *l*, or *w*; ¼); C. varieties; (*p*); Cypripedium macranthum (*d p*; ¾-1); Dahlia varieties; Dentaria digitata (*p*; 1½); Dianthus Caryophyllus vars. (*p*, &c., *sc*; 1½-2); D. plumarius (*p*, &c., *sc*; ¾-1); D. Seguierii (*pi-p*; 1); Dicentra eximia (*r-p*; ¾-1½); Dictamnus albus var. (*pa p*; 1-1½); Dodecatheon Meadia (*pi-p*, *w*, or *l*; ¾-1¼); D. M. frigidum (*d r-p*; ¾-1¼); Draba violacea (*v-p*; ½-1); Echinacea angustifolia (*pa p* or *pi*; 2-4); E. purpurea

Purple and Violet (Hardy Perennials)—*continued.*

(*r-p*, tipped *gy-g*; 3-4); Epilobium obcordatum (*pi-p*); Epimedium macranthum violaceum (*v*; ¾-1¼); Erigeron glaucus (*p*; ½-1); E. grandiflorus (*p* or *w*; ¼-¾); E. multiradiatus (*p*, disk *y*; ½-2); E. Roylei (*b-p*, disk *y*; ½-¾); E. speciosus (*v*, disk *y*; 1½); Erinus alpinus (*p*; ½); Erodium macradenum (*pa v*; ½); Fritillaria delphinensis (*p*; ½-1); F. Meleagris (1); F. pyrenaica (*d p*; 1½); Geranium atlanticum (*p*, veined *r*; 1-1½); G. dahuricum (*p*; 1½); G. macrorhizon (*r* or *p*; 1); G. sylvaticum (*p* or *b*, veined *r*; 2); G. Wallichianum (*p*; ¼); Geum coccineum (*p*; ½-1¼); Habenaria fimbriata (*l-p*; 1-1½); Helleborus olympicus (*p*; 2); Hesperis matronalis vars. (*sc*; 2-3); Hottonia palustris (*aq*, *l*, *y* eye; 1-2); Hyacinthus varieties (*p*, *sc*; ¾-1); Iberis Tenoreana (*p* or *w*; ½); Iris (Xiphion) alata (*l-p*; ½); I. balkana (*l-p*; 1); I. biflora (*v-p*; 1½); I. Douglasiana (*l-p*; ½-1); I. (Xiphion) filifolia (*d p*; 1-2); I. germanica (*p* and *l*, *sc*; 2-3); I. lævigata (*s-aq*, *d p*; 1); I. pumila (*l-p*, bearded *w*; ¼-½); I. (Xiphion) reticulata (*d v-p*; ¼); I. rubro-marginata (*p*; ½); I. sambucina (*p* and *y*, *sc*; 2); I. (Xiphion) tingitana (*l-p*; 2-3); I. tuberosa (*p*; 1); I. versicolor (*pa* and *d p*; 1-2); I. (Xiphion) vulgare (*p*; 1-2); I. (Xiphion) xiphioides (*l-p*, flushed *y-br*; 1-2); Lactuca macrorhiza (*v-p*; ½-3); Lathyrus magellanicus (*b-p*); Lilium Martagon (*p-r*, spotted *p*; 2-3); L. oxypetalum (*l-p*; 1-1½); L. polyphyllum (*p* and *w*; 2-3); Linaria alpina (*b-v*; ½); L. hepaticæfolia (*l-p*; ¼); L. purpurea (*b-p*; 1-3); L. triornithophora (*p*, *y* palate); Liparis lilifolia (*br-p*); Lophanthus scrophulariæfolius (*p*; 5); Lysimachia atropurpurea (*d p*; 2); Mazus pumilio (*pa v*); Moltkia petræa (*d v-b*; ½); Monarda fistulosa (*p*; ½); Morœa edulis (*v*; 4); Muscari comosum monstrosum (*b-v*; 1-1½); Onopordon Acanthium (*p*; 4-5); Orchis foliosa (*p*; 1½-2½); O. latifolia (*p* or *r*; 1); Orobus flaccidus (6); Oxalis tetraphylla (*p-v* or *r*); Pæonia varieties (*sc*); Pentstemon campanulatus vars. (*v* or *d p*; 1½); P. diffusus (*p*; 1½); P. glaber (*v*, *p*, or *b*; ½-1); P. gracilis (*l-p* or *w*; 1); P. heterophyllus (*pi-p* or *pi*; 1½); P. Menziesii Douglasii (*l-p*, *p-r* at base; 1); P. pubescens, (*v* or *p*; 1-3); P. venustus (*p*; 2); P. varieties; Petalostemon violaceus (*pi-p*; 1); Phalaris arundinacea (*p*; 3-5); Phlomis herba-venti (*p-v*; 1-1½); Phlox amœna (*p*, *pi*, or *w*; ½-1¼); P. maculata (*p*, *sc*; 2); P. ovata (*r-p*; 1-1½); P. paniculata (*pi-p*, varying to *w*; 3-4); P. pilosa vars. (*p*; 1-2); P. reptans (*p* or *v*); P. varieties (*p*); Physochlaina physaloides (*p-v*; 1-1½); Physostegia virginiana (*p* or *w-pi*; 1½-4) and var.; Phyteuma comosum (*p* or *b*; ¼-½); Plumbago Larpentæ (*v*; 1); Polemonium humile (*p* or *b*; ½); Prenanthes purpurea (*p*; 4); Primula auriculata (*p*, *w* eye; ¼); P. calycina (*p*); P. denticulata cashmeriana (*pa p*, *y* eye); P. farinosa (*pa p*, *y* eye; ¼-1); P. glutinosa (*b-p*; ¼); P. obconica (*p* or *pa l*; ½-1); P. scotica (*p*, *y* eye); P. Steinii (*p*); P. viscosa (*pi-p*, *w* eye; ¼); P. v. pedemontana (*pi-p*, *y-w* eye; ½); Ramondia pyrenaica (*p*; ½); Ranunculus asiaticus vars. (*p*; ¾); R. parnassifolius (*p* or *w*; ¼-½); Romulea Bulbocodium (*v*, *y* below; ½); Rudbeckia purpurea (*r-p*; 3-4); Salvia discolor (*p* and *v-bk*; 2-3); S. interrupta (*v-p*, *r-p*, and *w*; 3-4); Saussurea pulchella (*p*; 2); Saxifraga moschata (*p* or *pa y*; ½); S. oppositifolia (*p*); S. purpurascens (*p*; ½-½); S. retusa (*p*; ½); Scilla nutans vars. (*p*); Scutellaria alpina (*p*, or *p* and *y*); Sedum pulchellum (*pi-p*; ½); S. Rhodiola (*r-p* or *g*; ¾); Sempervivum Funckii (*r-p*; ½-¾); S. montanum (*mv-p*; ½); Senecio pulcher (*p*, disk *y*; 1-2); Silene Schafta (*p*; ½); Sisyrinchium grandiflorum (*p*; ¾); Soldanella alpina (*v*; ½); S. montana (*p*; ½); Stachys grandiflora (*v*; 1); Streptopus roseus (*pi-p*; 1½); Thermopsis barbata (*d p*; 1); Tradescantia virginica (*v*, *p*, or *w*; ½-2); Trifolium alpestre (*p*; ½-1); T. Lupinaster (*p*; 1-1½); Trillium erectum (*d p*; 1); Tulipa varieties (*v*); Veratrum nigrum (*bk-p*; 1-3); Vinca major (*b-p*); V. minor (*b-p*); Viola cucullata (*p* or *v-b*, &c.); V. Munbyana (*v* or *y*); V. odorata vars. (*p* or *v*, *sc*); V. tricolor vars. (*p* or *v*).

Purple and Violet—*continued.*

Half-hardy.—ANNUALS.—Amarantus speciosus (*r-p*; 3); Callistephus chinensis vars. (*p* and *v*; ½-2); Cobæa scandens (*d p*); Gomphrena globosa purpurea (*p*; 1½); Pennisetum longistylum (*p*; 1-1½); Phlox Drummondii vars. (*p*; 1); Verbena varieties (*p*); Zinnia elegans varieties (*v-p*; 2).

BIENNIALS.—Mathiola incana vars. (*p*; 1-2).

PERENNIALS.—Amaryllis Belladonna (*p*, &c.; 2); Anagallis linifolia Wilmoreana (*b-p*; ½); Caryopteris Mastacanthus (*v*; 2); Eryngium pandanifolium (*p*; 10-15); Gladiolus Papilio (*p*, marked *y*; 3); G. varieties (*p* or *v*; 1-3); Myosotis azorica var. (*b-p*; ½-¾); Oxalis arenaria (*v-p*; ¼); Petunia varieties (*p*); Sarracenia Drummondii (*p*; 2); S. psittacina (*p*; 1); S. purpurea (*p*; 1); S. rubra (*r-p*; 1-2); Scilla chinensis (*pi-p*; 1-1½); Tricyrtis macropoda (*pa p*; 2-3).

Tender.—ANNUALS.—Anisomeles ovata (*st, p*; 2-3); Euryale ferox (*st aq, v*); Impatiens flaccida (*st, p*; ½-1½); Martynia fragrans (*c-h*; 2); Salpiglossis sinuata vars. (*c-h, p*; 2).

BIENNIAL.—Ebenus Sibthorpii (*c-h, p*; 2).

PERENNIALS.—Achimenes grandiflora (*i-h, v-p*; 1½); Æchmea distichantha (*st, p*, bracts *r*; 1); Æ. glomerata (*st, v*, bracts *r*; 1½); Alocasia cuprea (*st, p-r*; 2); Amorphophallus Titanum (*st, bk-p* and *g*; 10); Anchomanes Hookeri (*st, pa p*, spadix *w*; 3); Arisæma galeata (*c-h, p* and *g*); A. speciosa (*c-h, d p, g*, and *w*); Arum palæstinum (*c-h, p, bk*, and *y-w*; 1½-2); Barbacenia purpurea (*i-h, sc*; 1½); B. Rogieri (*i-h, sc*; 1½); Barkeria Lindleyana (*c-h, pi-p, p*, and *w*; 2); Batatas bignonioides (*i-h, d p*); B. edulis (*i-h, p, w* outside); B. paniculata (*i-h, p*); Bifrenaria vitellina (*st, y-p*; 1); Billbergia Quesneliana (*st, d p*, bracts *pi*; 6); Bletia Shepherdii (*st, p*, lip marked *y*; 2); B. Sherrattiana (*st, pi-p*, marked *w* and *y*); Brachyspatha variabilis (*st, g-p*, spadix *w* and *o-r*; 3); Burlingtonia rigida (*st, p-w*, spotted *pi*; 1); Calanthe Masuca (*st, v*, lip *v-p*; 3); Calceolaria arachnoidea (*c-h, p*; 1); Calochortus purpureus (*c-h, p* and *y*; 3); Canarina Campanula (*c-h, y-p* or *o*; 3-4); Canna expansa rubra (*st, p*; 4-6); Cattleya Dawsoni (*i-h, pi-p, y*, and *pi*; 1); C. Skinneri (*i-h, pi-p*, lip *w* at base; 1½); Ceropegia elegans (*st, p*); Chironia jasminoides (*c-h, p* or *r*; 1-2); Cineraria cruenta (*c-h, r-p*; 2); C. varieties (*c-h, p*); Cirrhopetalum Cumingii (*st, r-p*; ½); Cobæa scandens (*c-h, d p*); Comparettia falcata (*i-h, pi-p*; ½); Crawfurdia fasciculata (*st, p*); C. speciosa (*st, p*); Cyclamen varieties (*c-h, p*, &c.); Cycnoches Egertonianum (*st, d p*; 2); Cymbidium bicolor (*st, pa p*, marked *r*; 1); Cypripedium barbatum (*st, p* and *w*; 1); Dendrobium Heyneanum (*st, v* and *w*; ¾); D. Kingianum (*c-h, v-p*; ½); D. lituiflorum (*st, pi-p*, lip *w* and *p*, 1½); D. superbiens (*st, pa p*, sometimes *r*, shaded *br*; 1-3); D. s. Goldiei (*st, v*; 1-3); Dichorisandra leucophthalmus (*st, b-p, w* at base; 1-1½); Drosera filiformis (*c-h, p*; 1); D. spathulata (*c-h*; ¼); Eichhornia crassipes (*st aq, v*); Epidendrum atropurpureum (*c-h, p* or *d pi*; ½-1); E. evectum (*st, pi-p*); E. paniculatum (*c-h, p* or *l-p*, column tipped *y*; 2-4); E. syringothyrsis (*st, d p*, marked *o* and *y*; 3); Episteph ium Williamsii (*st, r-p*; 1); Gladiolus varieties (*c-h, p* or *v*; 1-3); Gloxinia varieties (*st*); Gymnostachyum venustum (*st, p*; ½); Hyacinthus varieties (*c-h, p, sc*; ¾-1); Hypoestes sanguinolenta (*st, p*, marked *w*; ½-1); Lælia caloglossa (*i-h, pa p*); L. Dayana (*i-h, pi-p*, lip margined *l* and *w*); L. Dominiana (*i-h, pa p*, lip *bk-p*); L. Jongheana (*i-h, b-p*, lip *p* and *y*); Lotus jacobæus (*c-h, bk-p*; 1-3); Maurandya Barclayana (*c-h, v-p*); M. scandens (*c-h, v-p*); Maxillaria variabilis (*i-h, p*); Mesembryanthemum Cooperi (*c-h, p*; ¼); M. cordifolium variegatum (*c-h, pi-p*); Miltonia spectabilis Moreliana (*i-h, p*, lip marked *pi*); Mormodes atropurpureum (*st, d p-br*; 1); Oncidium ornithorhynchum (*c-h, pi-p, sc*); Onoseris Drakeana (*c-h, p*); Oxalis elegans (*c-h, p*; ½); O. hirta (*c-h, pa v*, varying to *d r*; ¼); O. Martiana (*c-h, d p-pi*); Pelargonium glauciifolium (*ch, d p*); P. varieties (*c-h*); Peristrophe speciosa (*st, p* and *r-p*; 4); Phaius

Purple and Violet (Tender Perennials)—*continued.*

Bensonæ (*i-h, pi-p*, marked *y* and *w*; 1); Phalænopsis speciosa imperatrix (*st, pi-p*); P. Veitchiana (*st, p*); P. violacea (*st, v, r*, and *w*); Physidium cornigerum (*st, p*; 1); Podolepis gracilis (*c-h, w, p*, or *l*; 3); Rhœo discolor (*st, p* or *b*); Saccolabium calopterum (*st, p, w* at base); Salvia ianthina (*c-h, v-p*; 2); Sanchezia longiflora (*st, p*); Schomburgkia tibicinis grandiflora (*st, p, o, w*, and *y*); S. undulata (*st, br-p* and *v-p*); Sedum Ewersii (*c-h, pa v* or *pi*; ½); Senecio speciosus (*c-h, p*; 1); Sinningia speciosa (*st, v*, &c.); Sobralia Cattleya (*st, p* and *p-br*, lip crested *y*); Sophronitis violacea (*c-h, v*; ¼); Sparaxis grandiflora stellaris (*c-h, p*; 1-2); Stelis Bruckmülleri (*c-h, pa p* and *y-p*); S. ciliaris (*c-h, d p*); Stylidium bulbiferum macrocarpum (*c-h, g-p*); Tacca pinnatifida (*st, p*); Thysanotus junceus (*c-h, p*; 1-2); T. tuberosus (*c-h, p*; ½-1); Tigridia atrata (*c-h, d p*, marked *g* and *br*; 2); T. Meleagris (*c-h, pa* and *d p*; 1½); Tillandsia ionantha (*st, pa v*; ¼); T. Lindeni (*st, b-p*, bracts *r*); Typhonium divaricatum (*st, d p*); Utricularia Humboldtii (*st, b-p*); Vanda suavis (*st, p* and *w*); Watsonia Meriana (*c-h, p* or *r*; ¾-2); Zygopetalum Gairianum (*st, v*, marked *p-mv, w-y*, &c.); Z. Sedeni (*c-h, p*).

RED.—The shades are indicated by the following abbreviations: *bd* (blood), *ca* (carmine), *cin* (cinnabar), *cr* (crimson), *d* (dark), *mar* (maroon), *pa* (pale), *s* (scarlet), *ver* (vermilion).

Hardy.—ANNUALS.—Adonis æstivalis (*cr*; 1); A. autumnalis (*bd*; 1); Anagallis grandiflora (*ver*, varying to *b*; ¼); Armeria cephalotes (*cr* or *pi*; 1-1½); Centranthus macrosiphon (*pi-ca*; 2); Clarkia elegans (*cr*; 2); Collomia coccinea (*d*; 1-1½); Crepis rubra (½-1); Delphinium Ajacis (*r, b*, or *w*; 1-1½); Fedia Cornucopiæ (½); Gaillardia amblyodon (*bd*; 2-3); G. pulchella (*cr*, tipped *y*; 2-3); Glaucium phœniceum (*cr*, spotted *bk*; ¾); Iberis umbellata atropurpurea (*d cr*; ½-1); Lathyrus odoratus vars. (*sc*); Malcolmia maritima vars. (½-1); Mathiola annua vars. (1-2); Œnothera Whitneyi (*pi-r*, blotched *r*; 1-1½); Papaver Rhœas (*s*; 1) and vars; Scabiosa atropurpurea (*d cr, sc*; 2-3); Sedum sempervivoides (¼-½); Tropæolum majus vars.

BIENNIALS.—Anagallis fruticosa (*ver*; 2); Dianthus chinensis, variable (½-1); D. c. Atkinsoni (*bd*; ½-1); Eschscholtzia californica crocea var. (1); Hesperis tristis vars. (*b-r, sc*; 1-2).

PERENNIALS.—Agrostemma coronaria var. (*cr*; 1-2); A. flos-Jovis (*s* or *p*; 1½); Allium Macnabianum (*m*; 1); A. sphærocephalum (1½-2½); Alströmeria chilensis (*bd* or *pi*, marked *y*; 2-3); Althæa flexuosa (*s*; 2-3); A. narbonensis (*pa*; 3-6); Anemone fulgens (*ver* or *s*, stamens *bk*); A. japonica (*pi-ca*, anthers *y*; 2-3); A. multifida (*r* or *y*; ½-1); A. stellata (*pi-r, p*, or *w*; ¾); Apocynum androsæmifolium (1-2); Aquilegia canadensis (*s*, mixed *y*; 1-2); A. formosa (limb *y*; 2-4); A. fragrans (*pa*, or *w*; 1½-2); Armeria vulgaris, variable (½-1); Asarum caudatum (*br-r*); Asclepias incarnata (*r* or *p*; 2); Astilbe rivularis (*r* or *y-w*; 3); Bellis perennis conspicua (¼); Callirhoe involucrata (*cr*; ½); C. Papaver (*v-r*; 3); Calystegia Soldanella (*pa*); Centranthus ruber (2-3); Cheiranthus Cheiri vars. (*d, sc*; 1-2); Chrysanthemum varieties; Convolvulus althæoides (*pa*, or *l*); C. cantabricus (*pa*; ½-1); C. chinensis (*p-cr, y* star; 2-3); C. Scammonia (*pa*, or *c*); Dahlia Juarezii (*s*; 3); D. varieties; Delphinium cardinale (*s*; 3-4); D. nudicaule (petals *y*; 1-1½); Dianthus alpestris (½-¾); D. atrorubens (*d*; 1); D. barbatus vars. (1-1½); D. Caryophyllus vars. (*sc*, 1½-2); D. cruentus (*bd-s*); Dodecatheon integrifolium (*pi-cr*; ¼-½); Dicentra formosa (½); D. spectabilis (*pi-cr*; ¾-2); Epilobium augustifolium (*cr*; 3-6); E. rosmarinifolium (2); Epimedium alpinum (*d cr*; ½-¾); E. rubrum (*cr*; ½-¾); Erodium Manescavi (*p-r*; 1-2); Fritillaria imperialis (*cr*, varying to *y*; 3); F. i. Aurora (bronzy *cr*; 3); F. i. Minature (*d*; 3); F. i. rubra maxima (3); F. recurva (*s*; 2); Geranium argenteum (¼); G. cinereum (½); G. macrorhizon (*p* or *d r*; 1); G. sanguineum

Red (Hardy Perennials)—*continued.*

(*cr* or *bd*; 1-2); Geum rivale (1-3); Gillen'a trifoliata (varying to *w*; 1½); Gunnera scabra (4); Habenaria psychodes (*s*, varying to *pi*); Hedysarum coronarium (*d*; 3-4); H. c. flexuosum (tinged *b*; 3-4); Helianthemum vulgare vars.; Hesperis matronalis vars. (*sc*; 2-3); Heuchera americana (1½); H. sanguinea (*d*; ¾-1½); Hieracium aurantiacum (*o-r*; 1-1½); Hyacinthus varieties (*sc*; ¾-1); Lilium bulbiferum (2-4); L. canadense (*pa*, spotted, varying to *y*; 1½-3); L. c. parvum, (*o-r*, spotted *r-p*; 1½-2); L. Catesbæi (*o-r*, spotted *p*; 1-2); L. chalcedonicum (*s*, rarely *y*; 2-3); L. concolor Buschianum (*s*; 1-3); L. davuricum (*s*; 2-3); L. elegans (*pa s*); L. pardalinum Bourgæi (*o-r*, spotted *p*; 3-7); L. p. Robinsoni (*ver*, shading to *y*, spotted; 7-8); L. philadelphicum (*o-r*, spotted *p* below; 1-3); L. pomponium (*r* or tinged *o*; 1½-3); L. pseudo-tigrinum (*s*, dotted *bk* within; 3-4); L. superbum (*o-r*, spotted; 4-6); L. tenuifolium (*s*; ½-1); L. tigrinum (*o-r*, spotted *p-bk*; 2-4) and vars.; Lychnis chalcedonica (*s*; 1½-3½); L. coronaria (3); L. fulgens (*ver*; ½-1); L. f. Haageana (*s*, varying to *w*; ½-1); Malva Alcea fastigiata (2-3); Mimulus cardinalis (1-3); Monarda didyma (*s*; 1½); Orchis latifolia (*r* or *p*; 1); Ourisia coccinea (*s*; ½-1); O. Pearcei (*cr*, streaked *bd*); Oxalis tetraphylla (*r* or *p-v*); Oxytropis Lambertii (*pi-ca*; ½-1); Pæonia officinalis (*d cr*; 2-3); P. tenuifolia (*d cr*; 1-1½); P. varieties (*sc*); Papaver bracteatum (4); P. orientale (*s*; 2-3) and vars.; P. pilosum (*pa s* or *o*, marked *w*; 1-2); Pentstemon barbatus (*pi-r* to *ca*; 3); P. b. Torreyi (*d s*; 3); P. Eatoni (*cr-s*; 1½); P. Hartwegiana (*s* or *bd*; 2); P. Murrayanus (2-3); P. varieties; Phlox glaberrima (1-2); P. paniculata vars. (3-4); P. varieties; Polygonum affine (*pi-r*; ½-¾); P. amplexicaule (*pi-r* or *w*; 2-3); Primula altaica (*p-cr* or *mv*; ¼-½); P. Auricula vars. (½); P. japonica vars. (*cr* or *mar*; 1-1½); P. officinalis vars. (¼-1); P. rosea (*pi-ca*, *y* eye; ¼); Salvia Rœmeriana (*d s*; 1-2); Saponaria ocymoides (*r* or *pi*); Saxifraga ligulata (*pa*; 1); Scilla bifolia (*r*, *b*, or *w*; ½); S. nutans rubra; S. peruviana (*r*, *w*, or *l*; 1-1½); Scopolia carniolica (*y* or *g* within; 1); Sempervivum arachnoideum (filaments *p*; ¼) and var.; S. atlanticum (*pa*; 1); S. Boissieri (¾); S. calcaratum (*pa*; 1½); S. calcareum (*pa*, keeled *g*; 1); S. fimbriatum (½-¾); S. Moggridgei (¾); S. Pomelii (*pi-r*; ½-¾); Silene virginica (*d cr*; 1-2); Spiræa palmata (*cr*; 1-2); Statice tatarica (1); Symphytum bohemicum (*r* or *r-p*; 1-3); Tropæolum speciosum (*s*); Tulipa Eichleri (*s*, marked *bk* and *y*); T. elegans (*y* eye); T. Gesneriana vars.; T. Greigi (blotched *bk*); T. macrospeila (blotched *bk* and *y*); T. Oculus-solis (blotched *bk* and *y*; 1-1½); T. præcox (blotched *bk* and *y*); T. pubescens (*sc*); T. varieties.

Half-hardy.—ANNUALS.—Amarantus hypochondriacus (*d cr*; 4-5) and var.; Calandrinia Menziesii (*d p-cr*); Callistephus chinensis vars (½-2); Gomphrena globosa nana (1½); Impatiens Balsamina (1-2); Mimosa pudica (1); Mirabilis Jalapa (*cr*, *w*, or *y*; 2); Phlox Drummondii vars. (1); Salvia coccinea (*s*; 2); Verbena varieties; Zinnia elegans vars. (*s*, *cr*, &c.; 2).

PERENNIALS.—Amaryllis Belladonna (*r* or *w*, &c.; 2); Amphicome arguta (3); Anagallis linifolia vars. (¾-1); Androsace carnea eximia (*pi-cr*, *y* eye; ¼); Anomatheca cruenta (*ca-cr*; ½-1); Bessera elegans (*s*, or *s* and *w*; 2); Blumenbachia chuquitensis (*y* within); Brodiæa coccinea (*bd*, *y-g* at apex; 1½); Crocosmia aurea (*o-r*; 2); Gladiolus brachyandrus (*pa s*; 2); G. cardinalis (*s*; 3-4); G. Colvillei (marked *p*; 1½); G. cruentus (*s*, *y-w* at base; 2-3); G. psittacinus (*s*, marked *y*, tube *g* and *p*; 3); G. Saundersii (*cr*, spotted *w*; 2-3); G. varieties (1-3); Kniphofia aloides (coral-*r*, fading to *o*; 3-4) and vars.; K. Burchelli (*s* and *y*, tipped *g*; 1½); K. Leichtlinii (*pa ver* and *y*); K. Rooperi (*o-r*, turning *y*; 2); Lobelia cardinalis (*s*; 1-2); L. splendens (*s*; 1-2); Schizostylis coccinea (3).

Tender.—ANNUALS.—Celosia cristata (*st*, *d*; ¾); Salpiglossis sinuata vars. (*c-h*; 2); Mimosa pudica (*st*; 1).

BIENNIAL.—Humea elegans (*c-h*, *br-r*, *cr*, or *pi*; 5-6).

Red (Tender)—*continued.*

PERENNIALS.—Achimenes pedunculata (*i-h*, *y* eye; 2); A. picta (*i-h*, *y* eye; 1½); Ada aurantiaca (*st*, *o-s*, streaked *bk*); Æchmea discolor (*st*, *s*; 2); Æ. fulgens (*st*, tipped *b*; 1); Æ. hystrix (*st*, *s*; 2½); Æ. spectabilis (*st*, *pi-cr*); Æ. Veitchii (*st*, *s*; 1); Agalmyla staminea (*st*, *s*; 2); Alstrœmeria caryophyllæa (*st*, *s*, *sc*; ¾-1); A. densiflora (*c-h*, *s*, spotted *bk*); Amomum angustifolium (*st*, *r* or *y*; 8); Ananas macrodonta (*st*, tinted buff); Anguloa Ruckeri sanguinea (*c-h*, *d bd*; 1½); Anigozanthus coccineus (*c-h*, *s*; 5); Antholyza caffra (*c-h*, *s*; 2); Anthurium Andreanum (*st*, *o-r*, spadix *y*; 1); A. Bakeri (*st*, *s* and *pi*; 1); A. ferrierense (*st*); A. Scherzerianum (*st*, spadix *o*; 1-1½) and vars.; Arpophyllum spicatum (*i-h*, *d*; 1½); Asclepias curassavica (*st*, *o-s*; 1-3); Babiana ringens (*c-h*, *s*; ½-¾); B. stricta villosa (*c-h*, *cr*; ½); Batatas Cavanillesii (*i-h*, *pa*); Begonia boliviensis (*i-h*, *s*; 2); B. Chelsoni (*i-h*, *o-r*; 2); B. Clarkii (*i-h*; 1½); B. Davisii (*i-h*; ½); B. Frœbeli (*i-h*, *s*; ¾); B. geranioides (*i-h*, waved *w*; 1½); B. magnifica (*i-h*, *pi-ca*; 2); B. Sutherlandi (*i-h*, *o-r*, shaded *p-r*; 1-2); B. Veitchii (*i-h*, *cin*; 2); B. varieties (*i-h*); Blandfordia Cunninghamii (*c-h*, *y* above; 1); B. flammea elegans (*c-h*, *c*, tipped *y*; 2); B. princeps (*c-h*, *o-r*, *y* within; 1); B. grandiflora (*c-h*, *c*; 2); Blumenbachia contorta (*c-h*, *o-r*); Bomarea oligantha (*c-h*, *y* within); B. patoccensis (*c-h*, *c*); B. Shuttleworthii (*c-h*, *o-ver* and *y*, spotted); Bravoa geminiflora (*c-h*, *o-r*; 2); Bromelia bicolor (*st*, *s*); Broughtonia sanguinea (*st*, *bd*; 1½); Brunsvigia falcata (*i-h*; ¾); B. Josephineæ (*i-h*, *s*; 1½); B. multiflora (*i-h*; 1); Burbidgea nitida (*st*, *o-s*; 2-4); Canna Achiras variegata (*st*, *d*; 4); C. Annæi fulgida (*st*, *o-r*; 3-5); C. A. rosea (*st*, *ca-pi*; 5); C. Auguste Ferrier (*st*, *o-r*; 10); C. Bihorelli (*st*, *d cr*; 6-7); C. discolor (*st*; 6); C. gigantea (*st*, *o-r* and *p-r*; 6); C. limbata (*st*, *y-r*; 3); C. nigricans (*st*, coppery *r*; 4½-8); C. Van-Houttei (*st*, *s*); C. Warscewiczii (*st*, *s* and *p*; 3); Cattleya marginata (*i-h*, *pi-cr*, lip *pi* and *w*; 1); Centropogon Lucyanus (*st*, *pi-co*); Ceropegia Thwaitesii (*st*, *bd*, tube *y*); Chironia jasminoides (*c-h*, *r* or *p*; 1-2); C. linoides (*c-h*; 1-2); Cineraria varieties (*c-h*); Clianthus Dampieri (*c-h*, *bk* or *p* blotch; 2); Cœlia macrostachya (*i-h*; 1½); Comparettia coccinea (*i-h*, *s*, lip tinged *w*; ½); Costus igneus (*st*, *o-s*; 1-3); Crinum amabile (*st*, *sc*; 2-3); C. cruentum (*st*; 2); Curcuma Roscoeana (*st*, *s*, bracts *o*; 1); C. rubricaulis (*st*; 1); Cyclamen Coum (*c-h*, *d*; ¼); C. ibericum (*c-h*; ¼); C. neapolitanum (*c-h*, *r* or *w*, *v-p* spot; ¼); C. varieties (*c-h*); Cymbidium pendulum purpureum (*d*, lip *w* and *cr*; 2); Disa grandiflora Barrellii (*c-h*, *o-s*, lip veined *cr*; 2-3); D. g. superba (*c-h*, *s* and *cr*, veined *pi*; 2-3); Episcia fulgida (*st*, *ver*; ½); Falkia repens (*c-h*, *pa* throat); Fittonia gigantea (*st*, *pa*; 1½); Gesnera Cooperi (*st*, *s*, throat spotted; 2); G. Donkelaariana (*st*, *ver*; 1-2); G. exoniensis (*st*, *o-s*, *y* throat); G. pyramidalis (*st*, *o-r*, throat and lip *o*); Gladiolus varieties (*c-h*; 1-3); Gloxinia varieties (*st*); Hæmanthus abyssinicus (*st*, *s*; ½); H. cinnabarinus (*st*; 1); H. Kalbreyeri (*st*, *cr*; ½); H. Katherinæ (*st*, *d*); Hedychium angustifolium (*st*; 3-6); Hibiscus coccineus (*c-h*, *s*; 4-8); Hippeastrum Ackermanni (*i-h*, *cr*); H. equestre ignescens (*i-h*, *s*, marked *w*; 1); Homalomena Wallisii (*st*); Hyacinthus varieties (*c-h*, *sc*; ¾-1); Impatiens Sultani (*st*, *s*); I. Walkeri (*st*, *s*; 1-1½); Ixia speciosa (*c-h*, *d*; ½); Kennedya prostrata (*c-h*, *s*); K. p. Marryattæ (*c-h*, *pa s*); K. rubicunda (*c-h*); Lachenalia fragrans (*c-h*, *sc*; ½); Lælia autumnalis atrorubens (*i-h*, *r* or *m-p*, lip *w* below, *sc*; 1); L. cinnabarina (*i-h*, *cin*; 1-1½); L. flammea (*i-h*, *o-s*, lip *p-cr*); L. harpophylla (*i-h*, *o-s*, lip blotched *w*); L. monophylla (*i-h*, *o-s*); Lobelia fulgens (*c-h*, *s*; 1-2); Lycoris Sewerzowi (*c-h*, *br-r*; 1); Masdevallia amabilis (*c-h*, *o-ca*; ½); M. ignea (*c-h*, often shaded *cr* or *v-pi*; ½); M. Lindeni conchiflora (*c-h*, *pi-r*); L. regalis (*c-h*, *cr*); Nerine curvifolia (*c-h*, *s*); N. flexuosa (*c-h*, *cr-s*, tinged *o*; 1); N. sarniensis corusca (*c-h*, *o-s*; 1); N. s. venusta (*c-h*, *s*; 2-2½); Nymphæa Devoniensis (*st aq*, *ro-r*); N. Lotus dentata (*st aq*); Oncidium Cebolleta (*st*, *y-r*, spotted); Oxalis Bowiei (*c-h*, *pi-r*; ½-¾); O. hirta (*c-h*, *d*, varying to

Red (Tender Perennials)—*continued.*

pa v; ¼); O. lasiandra (*c-h, cr*; ¾-1½); O. variabilis rubra (*c-h*; ¼); Pelargonium varieties (*c-h*); Phormium tenax (*c-h, r* or *y*; 6) and vars.; Pinguicula caudata (*c-h, ca*); Pitcairnia corallina (*st*, petals edged *w*); P. fulgens (*st*; 3); P. Karwinskiana (*st*; 1-2); P. muscosa (*st*; 1); P. pungens (*st*; 1-1½); P. tabulæformis (*st*); Plumbago rosea (*st, pi-s*; 2); Pterodiscus speciosus (*c-h, l* or *r*; 2); Renanthera coccinea (*i-h, bd*); Salvia coccinea (*c-h, s*; 2); S. gesneræflora (*c-h, s*; 2); Scutellaria costaricana (*st, y-s*, lip *y* within; ½-1½); S. Lehmanni (*st, s*; 1-2); S. Mocciniana (*st, s*, lip *y* within; 1½); S. splendens (*st, s*; 1); Selenipedium Sedeni (*i-h, cr, p-cr*, and *w*; 1½); Sinningia speciosa vars. (*st*); Siphocampylos betulæfolius (*st*; 3); S. coccineus (*st, s*; 3); S. Humboldtianus (*st, s*; 3); Sophronitis grandiflora (*c-h, s* or *cin*); S. militaris (*c-h, cin* or *cr*, lip *y* and *r*; ½); Sparaxis tricolor grandiflora (*c-h, cr*, 1-2); Spigelia splendens (*st, s*; 1½); Spiranthes colorans (*i-h, s*; 2); Sprekelia formosissima (*c-h, cr* or *w*; 2); Stachys coccinea (*c-h, s*; 1-2); Stenomesson coccineum (*i-h, cr*; 1); S. incarnata (*i-h*; 2); Swainsona galegifolia (*c-h, d*; 1); Thunbergia coccinea (*st*, varying to *o-pi*); Trichopilia crispa (*i-h, cr*, edged *w*); Tritonia crocosmiflora (*c-h, o-s*); T. miniata (*c-h, s*; ¾-1); Tropæolum Jarrattii (*c-h, o-s*, dotted *y*); Vallota purpurea (*c-h*; 2-3); V. p. eximia (*c-h*, throat *w*; 2-3); Watsonia densiflora (*c-h, pi-r*; 1½-2); W. Meriana (*c-h, s* or *p*; ¾-2).

VIOLET.—*See* **Purple and Violet.**

WHITE.—The ivory shade is indicated by the abbreviation *iv*; *d* and *pa* refer to dark and pale markings.

Hardy.—Annuals.—Agrostemma cœli-rosa (*w* or *pi*; 1); Argemone albiflora (1); A. hirsuta (2); Bellium bellidioides (¼); Blumenbachia insignis (scales *r-y*; 1); Borago officinalis (*w, b*, or *p*; 1-2); Centranthus macrosiphon var. (2); Clarkia elegans vars. (2); C. pulchella vars. (1½-2); Delphinium Ajacis (*w, r*, or *b*; 1-1½); Gilia liniflora (1); G. tricolor vars. (1); Heliotropium convolvulaceum (*sc*; 2); Iberis coronaria (1); Ionopsidium acaule (*w* tinged *v*, or *l*; ¼); Loasa vulcanica (2); Malcolmia maritima vars. (½-1); Malope trifida (*w* or *p*; 1); Matricaria inodora flore-pleno; Nemophila maculata (blotched *v-p*; ½); N. Menziesii alba (*bk* centre; ¼); Nigella damascena (*w* or *b*; 1-2); Papaver somniferum vars. (3-4); Polygonum orientale (*w* or *pi-p*; 3-10); Sabbatia calycosa (*s-aq*; ½-1½); Scabiosa atropurpurea vars. (*sc*; 2-3); Tropæolum majus vars. (*c*).

Biennials.—Androsace coronopifolia (½); Blumenbachia coronaria (1½); Digitalis purpurea (varying to *p*; 3-5); Eschscholtzia californica crocea vars. (1); Hesperis grandiflora vars. (4); H. tristis vars. (*w* or *c*, *sc*; 1-2); Michauxia lævigata (11).

Perennials.—Abronia fragrans (*sc*; 1-2); Acanthus mollis (*w* or *pi*; 3-4); Achillea Ageratum (2); A. atrata (2); A. Clavennæ (¾); A. Herba-rota (½); A. moschata (½); A. pectinata (1½); A. Ptarmica flore-pleno (1-2); A. serrata (1¼); A. umbellata (¼-½); Aciphylla Colensoi (6-9); A. squarrosa (6-9); Acis autumnalis (*pi* base; ½); A. grandiflorus (½); A. trichophyllus (flushed *r*; ½); Aconitum album (½); A. barbatum (*c*; 2-6); A. Halleri bicolor (variegated *b*; 4-6); A. ochroleucum (*c*; 2-4); A. variegatum albiflorum (1-6); A. v. bicolor (edged *b* or *l*; 5); Actæa alba (1-1½); A. spicata (*w* or *b*; 1) and var.; Agrostemma coronaria (*r* eye; 1-2); Aletris farinosa (1½-2); Alisma natans (*aq*); Allium neapolitanum (1¼-1½); A. nigrum (*w* or *v*; 2½-3¼); A. reticulatum attenuifolium (¾-1¼); Anemone alpina (variable; ½); A. baldensis (variable; ½); A. decapetala (*c* or *y*; 1); A. dichotoma (tinged *r* beneath; 1½); A. Hepatica alba; ½); A. japonica alba (2-3); A. narcissiflora (*c*; 1); A. nemorosa (½); A. n. bracteata flore-pleno (½); A. n. flore-pleno (½); A. palmata var. (¾); A. patens Nuttalliana (*c* or *p*; 1); A. rivularis (*s-aq, p* anthers; 1-2); A. stellata (*w, pi-r*, or *p*; ¾); A. sylvestris (*sc*; ½-1½); A. vernalis (*p* outside; ½); Antennaria margaritacea (2); Anthemis

White (Hardy Perennials)—*continued.*

Aizoon (¼); Anthericum Liliago (1-1½); A. Liliastrum (1-2); A. ramosum (2); Aponogeton distachyon (*aq*, anthers *p-br*, *sc*); Aquilegia cærulea alba (¾-1¼); A. fragrans (*w* or *pa r*; 1½-2); Arabis albida (½-¾); A. alpina (½); A. lucida (¼); A. petræa (¼); Arenaria balearica (¼); A. graminifolia (½-¾); A. grandiflora (¼-½); A. laricifolia (½); A. rotundifolia (¼); Armeria vulgaris alba (½-1); Arum tenuifolium (1); Asclepias quadrifolia (*sc*; 1); Asperula odorata (½-1); Asphodelus albus (2); Aster acuminatus (2); A. alpinus albus (½-¾); A. dracunculoides (3); A. dumosus (2); A. d. albus (2); A. ericoides (3); A. hyssopifolius (*w*, or shaded *p*; 1½-2); A. longifolius (3); A. multiflorus (3); A. Tradescanti (3); Astilbe rivularis (*y-w* or *r*; 3); Astragalus hypoglottis alba (¼); Astrantia carniolica (½-1); Baptisia alba (2); Bellevalia romana (½); B. syriaca (1); Bellidiastrum Michelii (1); Bellis perennis (¼); Brodiæa congesta alba (1); B. lactæa (midribs *g*; 1-2); Cacalia suaveolens (3-5); C. tuberosa (2-6); Caltha leptosepala (*s-aq*; 1); Camassia esculenta Leichtlinii (*c*; 2); Campanula barbata alba (½-1½); C. bononiensis var. (2-3); C. cæspitosa alba (½-¾); C. glomerata var. (1-2); C. grandis alba (1-2); C. isophylla alba; C. lactiflora (*c* tinged *b*, or *b*; 2-6); C. nitida (*w* or *b*; ¼-¾); C. nobilis var. (2); C. persicæfolia alba (1-3); C. p. a. coronata (1-3); C. pusilla alba (¼-½); C. pyramidalis vars. (4-5); C. Rapunculus (*w* or *b*; 2-3); C. rotundifolia alba (½-1); C. r. Hostii var. (½-1); C. speciosa (*w, b*, or *p*; 1-1½); C. Trachelium vars. (2-3); Cardamine asarifolia (1-1½); C. rhomboidea; C. trifolia (½); Carlina acanthifolia (2); Cephalanthera grandiflora (lip tipped *y*; 1-2); Cerastium alpinum (¼); C. Biebersteinii (½); C. Boissieri (¼-1); C. grandiflorum (½); C. tomentosum (½); Chaptalia tomentosa (½); Chelone obliqua alba (2-3); Chlorogalum pomeridianum (veined *p*; 2); Chrysanthemum argenteum (1); C. varieties; Cimicifuga americana (2-3); C. japonica (3); C. racemosa (3-5); Clematis recta (*sc*; 2-3); Clintonia uniflora (½); Convolvulus Scammonia (*c* or *r*); Coptis occidentalis (*s-aq*; ½-1); C. trifolia (*s-aq*; ¼-½); Corydalis cava albiflora (½); Crambe cordifolia (*sc*; 6); C. capense (*r* at back; 1); Crocus biflorus (varying to *l*; ¼); C. Boryi (*c*, throat *o*; ¼); C. vernus (*w, l*, or *v*; ¼); C. varieties; Dahlia varieties; Delphinium exaltatum (*w* or *b*; 3-6); D. grandiflorum album (1-2); D. g. album-plenum (1-2); Dentaria diphylla (*p* outside; ½-1); D. polyphylla (*c*; 1); Dianthus arenarius (2); D. barbatus vars. (1-1½); D. Caryophyllus vars. (*sc*; 1½-2); D. plumarius (variable, *sc*; ¾-1); Diapensia lapponica (½); Dicentra spectabilis vars. (¾-2); Dictamnus albus (1-1½); Diphylleia cymosa (1); Dodecatheon Meadia (*w, pi-p*, or *l*; ¾-1½); Draba Mawii (¼); D. nivalis (¼); Dracocephalum Ruyschianum japonicum (bordered *b*; 2); Drypis spinosa (*w* or *pa pi*; ½); Epilobium hirsutum (*w* or *pa pi*; 3-5); Epimedium macranthum (¾-1½); E. Musschianum (1); Eremurus himalaicus (1½-2); Erigeron grandiflorus (*w* or *p*; ¼-¾); Erodium pelargoniiflorum (spotted *p*; ¾); Erythronium dens-canis (*w* or *p-pi*, (½); Fragaria chilensis (1); F. c. grandiflora (1); Fritillaria Meleagris var. (1); Funkia ovata (*w* or *b-l*; 1-1½); F. subcordata (1½-2); Galanthus Elwesii (spotted *g*; ½-1); G. nivalis (marked *g*; ½); G. plicatus (*g-w*; ½); Galax aphylla (¼-½); Galega officinalis albiflora (2-3); Galtonia candicans (4); Gaura Lindheimeri (*pi-w*; 4); Gentiana Pneumonanthe vars. (½-1); Geum triflorum (edged *p-r*; ¾-1); Gillenia trifoliata (varying to *r*; 1½); Gratiola officinalis (striated *p*; 1); Gynerium argenteum (4-6); Gypsophila cerastioides (veined *r*; 3½); G. paniculata (2-3); Habenaria blephariglottis; Hesperis matronalis vars. (*sc*; 2-3); Heteropappus hispidus (1); Houstonia serpyllifolia (¼); Hyacinthus varieties (*sc*; ¾-1); Iberis semperflorens (*sc*; 1-2); I. Tenoreana (*w* or *p*; ½); Ipomœa pandurata (throat *p*); Iris florentina (tinged *l*, *sc*; 2-3); I. Guldenstadtiana (marked *y*; 2); Isopyrum thalictroides (¾-1¼); Lathyrus sylvestris platyphyllus var.; Leucoium æstivum (tipped *g*; 1½); L. Hernandezii (spotted *g*; 1-1½); L. vernum (spotted *g*, *sc*; ¼-½); Lilium

White (Hardy Perennials)—*continued.*

auratum (banded *y*, spotted *p*; 2-4); L. candidum (2-3); L. Krameri (tinged *r*, *sc*; 3-4); L. longiflorum (*sc*; 1-2); L. l. eximium (1-2); L. neilgherrense (*sc*; 2-3); L. speciosum (*w*, or marked *r*; 1-3); L. s. albiflorum (1-3); L. Washingtonianum (tinged *p* or *l*; 3-5); Lychnis chalcedonica var. (1½-3½); L. fulgens Haageana (varying to *r*; ½-1); L. vespertina (*sc*; 1-3); Lysimachia barystachys; L. clethroides (3); Malva moschata var. (2-2½); Mandragora vernalis (*w* or *b*; 1); Marshallia cæpitosa (*b-w*; 1); Melittis Melissophyllum (*c*, spotted *pi* or *p*; 1-1½); M. M. grandiflora (*c*, lower lip *p-r*; 1-1½); Mertensia sibirica var. (½-1½); Milla biflora (½); Mitchella repens (tinged *p*); Mœhringia muscosa (¼); Muscari botryoides alba; (½-1); Myrrhis odorata (2-3); Narcissus biflorus (crown *y*; 1); N. Bulbocodium monophyllus (¼-¾); N. calathinus (*w* or *pa y*; ¾-1); N. Macleai (*c*, crown *y*; 1); N. poeticus (crown edged *r*, *sc*; 1 or more); N. Tazetta (crown *y*, *sc*); N. T. papyraceus (tube *g-w*); N. triandrus (½-1); N. varieties; Nierembergia rivularis (tinged *y* or *pi*); Nothoscordum fragrans (barred *l*, *sc*; 1½-2); Nymphæa alba (*aq*); N. odorata (*aq*, tinged *r*, *sc*) and var.; N. pygmæa (*aq*, *sc*); Œnothera acaulis (fading to *r*; ½); Œ. californica (varying to *pi*, *y* centre, *sc*; 2); Œ. eximia (¾-1); Œ. taraxacifolia (fading to *r*; ½); Ornithogalum narbonense (1-1½); O. nutans (*g* at back; ¾-1); O. pyramidale (striped *g* at back; 1½-2); O. umbellatum (marked *g* outside; ½-1); Oxalis Acetosella (veined *p*; ¼); Pæonia albiflora (*w* or *pi*; 2-3); P. Emodi (2-3); P. varieties (*sc*); Pancratium illyricum (*sc*; 1½); Papaver alpinum (*w*, *pi*, or *y*; ½); P. nudicaule (*w*, *o*, or *y*; ¾-1½); Pedicularis verticillata (*w* or *pi*; ½-1); Peltaria alliacea (1); Pentstemon gracilis (*w* or *li-p*; 1); P. varieties; Petalostemon candidus (1); Petasites fragrans (*sc*; ½); P. frigida (½); Phlox amœna (*w*, *p*, or *pi*; ½-1¼); P. maculata candida (2); P. paniculata (varying to *pi-p*; 3-4); P. pilosa vars. (1-2); P. subulata vars.; P. varieties; Physalis Alkekengi (anthers *y*, calyx *r*; 1); Podophyllum Emodi (½-1); Polemonium cæruleum var. (2); P. reptans (*w* or *b*; ½); Polygonatum multiflorum (2-3); Polygonum amplexicaule *w* or *pi-r*; 2-3); P. compactum (2); P. cuspidatum (4-8); Potentilla congesta (1-2); P. unguiculata (¾-1); Pratia angulata; P. repens (tinted *v*); Primula involucrata (*s-aq*, *c*, *y* eye; ½); P. i. Munroi (*y* eye; ½-¾); P. japonica vars. (1-1½); P. minima (*w* or *pi*; ⅛); P. nivalis (¼-¾); P. sinensis (*w* or *pa l*; ¾); Puschkinia scilloides (striped *b*; ¼-¾); Pyrethrum corymbosum (1); P. Tchihatchewii (disk *y*; 2); P. uliginosum (disk *y*; 5); Pyrola rotundifolia (*sc*, ½) and var.; P. secunda (*g-w*; ¼-½); Ramondia pyrenaica var. (¼); Ranunculus aconitifolius (½-2) and vars.; R. amplexicaulis (¼-¾); R. anemonoides (tinted *pi*; ¼-½); R. parnassifolius (*w* or *p*; ¼-½); Romanzoffia sitchensis (¼); Sagittaria heterophylla (*s-aq*; 2); S. sagittifolia (*s-aq*, claws *p*); Salvia asperata (2); S. Sclarea (*b-w*; 2-3); Sanguinaria canadensis (½); Saponaria officinalis (*w* or *l*; 1-3); Saxifraga Burseriana (*c*; ½); S. B. major (½); S. cæsia (*c*; ⅛-¼); S. cæspitosa (¼); S. Camposii (¼-½); S. Cotyledon (1-2); S. granulata (½-1½); S. Hostii (sometimes dotted *p*; ½-1); S. hypnoides; S. lingulata (dotted *pi*; 1-1½); S. l. cochlearis (1-1½); S. longifolia (slightly dotted *r*; 1); S. Maweana (¼-½); S. Rocheliana coriophylla (¼); S. Stracheyi alba (¼-¾); S. umbrosa (sometimes sprinkled *r*; ½-1); S. valdensis (¼); S. virginiensis (¼-¾); Scilla amœna (*w* or *b*; ½-¾); S. bifolia (*w*, *b*, or *r*; ½); S. hispanica alba (¾-1); S. nutans vars.; S. peruviana alba (1-1½); Sedum album (¼); S. anglicum (*w* or tinted *pi*; ½); S. brevifolium (ribbed *pi*; ¼); S. glaucum (*pi-w*; ¼); S. maximum (tipped *r*; 1-2); S. m. hæmatodes (tipped *r*, 2-2½); Sida Napæa (4-10); Silene acaulis alba (½); S. alpestris (½); S. maritima and var.; Sisyrinchium grandiflorum var. (¾); Smilacina oleracea (tinged *pi* outside; 4); S. stellata (1-2); Spiræa Filipendula (*w* or *pi* outside; 2-3); S. Ulmaria (2-4); Thalictrum aquilegifolium (stamens sometimes *p*; 1-3); T. tuberosum (1); Tiarella cordifolia (½-1); Tradescantia virginica (*w*, *v*, or *p*; ½-2); Trifolium Lupinaster albiflorum (1-1½); Trillium erythrocarpum (striped *p* at base; 1); T. grandiflorum (changing to *pi*; 1-1½); T. nivale (2-4); Veratrum album (3-4); Veronica virginica (*w* or *b*; 2-6); Vinca minor vars.; Viola odorata vars. (*sc*); V. pedata (*w* or *b*); V. tricolor vars.; Xerophyllum asphodeloides (1-2); Yucca filamentosa flaccida (4-8); Y. f. orchioides (2-2½); Zephyranthes Atamasco (½-1); Zygadenus glaberrimus (2-3).

Half-hardy.—ANNUALS.—Acroclinium roseum album (1-2); Ageratum mexicanum var. (2); Ammobium alatum grandiflorum (1½-2); Brachycome iberidifolia (*w* or *b*; 1); Callistephus chinensis vars. (½-2); Datura fastuosa (*v* outside; 2-3); D. Metel (*sc*; 2); Gomphrena globosa alba (1½); Helichrysum bracteatum niveum (*w* and *y*; 3-4); Mentzelia ornata (*sc*; 2); Mesembryanthemum crystallinum; Mimulus Jalapa (*w*, *y*, or *r*; 2); Nicotiana affinis (*sc*; 2-3); Phlox Drummondii vars. (1); Schizanthus candidus (2); Schizopetalon Walkeri (1-2); Swertia paniculata (marked *p* or *g* at base; 1); Verbena varieties (*sc*); Zaluzianskia capensis (½-1); Zinnia elegans vars (2).

PERENNIALS.—Ainsliæa Walkeræ (anthers *r-p*; 1); Amaryllis Belladonna (*w* or *p*, &c.; 2); Astilbe japonica (1-2); A. j. variegata (1-2); Bellis rotundifolia cærulescens (*w* or *pa b*); Boussingaultia baselloides (turning *bk*); Chionographis japonica (½-1); Commelina cœlestis alba (1½); Conandron ramondioides (*w*, or *pi* and *p*; ½); Erodium Reichardi (veined *pi*; ½); Francoa ramosa (2-3); Gladiolus blandus (marked *r*; ½-2); G. Colvillei alba (1½); G. varieties (1-3); Lilium giganteum (tinged *g* and *p*; 4-10); Nolina georgiana (2-3); Ophiopogon japonicus (½); O. j. argenteo-marginatus (1½); Ornithogalum arabicum (*bk* centre, *sc*; 1-2); Pancratium maritimum (2); Petunia varieties (marked *r*, *p*, &c.); Salvia patens alba (2½); Saxifraga Fortunei (½); S. sarmentosa (¾); Sisyrinchium filifolium (lined *pa p-r*; ½-¾); S. iridifolium (*y-w*; ½-1); Tigridia pavonia albiflora (1-2); Tricyrtis hirta (outer segments dotted *p*; 1-3); Urginea maritima (keeled *p-g*; 1-4); Viola hederacea (*w* or *b*); Yucca glauca (5-6).

Tender.—ANNUALS.—Begonia humilis (*i-h*; ½); Browallia elata var. (*c-h*; 1½); B. grandiflora (*c-h*, *w* or *l*; 1-3); Celosia argentea (*st*; 1); Drosera rotundifolia (*c-h*; ¼); Nicotiana acutiflora (*c-h*; 1-2); Porana racemosa (*c-h*); Solanum sisymbriifolium (*c-h*, *w* or *pa b*; 4); Thunbergia alata alba (*st*); Victoria regia (*st aq*, *p* or *pi* towards the centre); Waitzia nivea (*c-h*, *w*, *pi*, or *pa y*; 1½).

BIENNIAL.—Basella alba (*st*; ¾).

PERENNIALS.—Actinocarpus minor (*c-h aq*); Actinotus helianthi (*c-h*; 2); Aerides crispum (*st*, suffused *p-pi*; 1); A. c. Warneri (*st*, lip *pi*); A. falcatum (*st*, marked *r* and *pi*); A. Fieldingii (*st*, mottled *pi*; 3-4); A. japonicum (*st*, marked *br-p* and *v*); A. maculosum Schrœderi (*st*, marked *l* and *pi*; 1½); A. mitratum (*st*, lip *v*); A. odoratum (*st*, *c*, marked *pi*, *sc*; 1½) and vars.; A. quinquevulnerum (*st*, marked *r* and *pi*, *sc*; ½); A. q. Farmeri (*st*, *sc*); A. Williamsii (*st*, *pi-w*); Aganisia fimbriata (*st*, lip *b*); A. pulchella (*st*, *y* blotch; ¾); Agapanthus umbellatus albidus (*c-h*; 2-3); A. u. maximus var. (*c-h*; 2-3); Aglaonema commutatum (*st*; 1); A. Mannii (*st*; 1½); Albuca fastigiata (*c-h*; 1½); A. Nelsoni (*c-h*, striped *r*; 4-5); Alocasia scabriuscula (*st*; 4-4½); Alpinia mutica (*st*, lip *y* and *r*; 5); Alströmeria Pelegrina alba (*c-h*; 1); Amomum Granum Paradisi (*st*, tinged *y* and *pi*; 3); Angræcum arcuatum (*st*; ½); A. bilobum (*st*, tinged *pi*, *sc*; ½); A. Chailluanum (*st*, spur *y-g*); A. citratum (*st*, *c* or *y*); A. eburneum (*st*, *w*); A. Ellisii (*st*, spur *br*, *sc*; 1); A. falcatum (*c-h*, *sc*; ½); A. Kotschyi (*st*, *y-w*, *sc*); A. modestum (*st*); A. pellucidum (*st*; ½); A. pertusum (*st*, ¾); A. Scottianum (*st*, spur *y*); A. sesquipedale (*st*; 1); Anguloa eburnea (*c-h*, lip spotted *pi*); A. uniflora (*c-h*, spotted *pi*, sometimes freckled *br*; 1½); Anthurium Harrisii pulchrum (*st*, spadix *r*; 3); A. Lindenianum (*st*, spadix *w* or *p*, *sc*; 3); A. ornatum

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(*st*, spadix *p*; 2½); A. Scherzerianum Williamsii (*st*, spadix *y*; 1-1½); Arthropodium neo-caledonicum (*c-h*; 1½); A. paniculatum (*c-h*; 3); A. pendulum (*c-h*; 1½); Arundo conspicua (*c-h*; 3-12); A. Donax (*c-h*, at first *r*; 12); Begonia amabilis (*i-h*, *w* or *pi*); B. Dregii (*i-h*; 1); B. echinosepala (*i-h*; 1½); B. glandulosa (*i-h*, *g-w*; 2); B. herbacea (*i-h*; ½); B. hydrocotylifolia asarifolia (*i-h*); B. imperialis (*i-h*; ½); B. laciniata (*i-h*, tinted *pi*, 2); B. monoptera (*i-h*; 2½); B. octopetala (*i-h*, *g-w*; 2); B. pruinata (*i-h*); B. Richardsiana (*i-h*; 1); B. scandens (*i-h*); B. Schmidtiana (*i-h*; 1); B. semperflorens (*i-h*, *w* or *pi*; 2); B. varieties (*i-h*); Bonatea speciosa (*st*; 2); Brassavola Digbyana (*i-h*, *c*, lip streaked *p*; ¾); B. Gibbsiana (*i-h*, spotted *br*); B. lineata (*i-h*, *c* and *w*, *sc*; 1); B. venosa (*i-h*, *c* and *w*; 1); Bromheadia palustris (*st*, marked *p* and *y*; 2); Bulbophyllum reticulatum (*st*, *w*, marked *p*); Burlingtonia Batemanni (*st*, *w*, lip *mv*, *sc*); B. candida (*st*, stained *y*, *sc*; 1); B. decora (*st*, *w* or *pi*, spotted *r*); B. fragrans (*st*, stained *y*, *sc*); B. venusta (*st*, *w*, tinted *pi* and *y*); Calanthe veratrifolia (*st*, tipped *g*; 2); C. vestita (*st*; 2½) and vars.; Caliphruria Hartwegiana (*c-h*, *g-w*; 1); C. subedentata (*c-h*; 1½); Calochortus albus (*c-h*, blotched; 1-1½); C. elegans (*c-h*, *g-w*, *p* at base; ¾); C. Nuttallii (*c-h*, spotted *p*; ½) C. venustus (*c-h*, marked *y* and *p*; 1½); Carpolysa spiralis (*c-h*, *r* outside; ½); Cattleya chocoensis (*i-h*, lip *w* and *p*); C. crispa (*i-h*, lip *r*); C. Devoniana (*i-h*, tinged *pi*, lip *pi-p*); C. Dominiana (*i-h*, shaded *pi*, lip *pi-p*, *w*, and *o*); C. D. alba (*i-h*, lip blotched *l*); C. labiata picta (*i-h*, lip *r*; 1); C. Mendelli (*i-h*, varying to *pi*, lip *m*); C. Trianæ Hilli (*i-h*, lip *m*, throat *y*); C. Wageneri (*i-h*, lip stained *y*); Centrosolenia picta (*st*; 1); Ceropegia Gardnerii (*c-h*, *c*, blotched *p*); Cheirostylis marmorata (*st*, calyx *r*); Chysis bractescens (*st*, lip blotched *y*); Cineraria varieties (*c-h*); Cœlia Baueriana (*i-h*, *sc*; 1); Cœlogyne asperata (*i-h*, *c*, marked *y* and *br*; 2); C. barbata (*i-h*, lip marked *p-br*; ½); C. corrugata (*c-h*, lip *y* and *o*); C. cristata (*i-h*, lip blotched *y*, *sc*); C. Cumingii (*i-h* lip *y*; 2); C. flaccida (*i-h*, lip marked *y* and *r*, *sc*; 1); C. Gardneriana (*i-h*, lip *y* at base; 1); C. Gowerii (*c-h*); C. humilis (*i-h*, tinged *pi*, marked *r* and *br*); C. maculata (*i-h*, lip barred *r*); C. media (*i-h*, *c*, lip *y* and *br*; 1); C. ocellata (*i-h*; lip marked *y*; 1); C. odoratissima (*c-h*, lip stained *y*, *sc*); C. Rhodeana (*st*, *w*, *sc*); C. viscosa (*i-h*, lip streaked *br*); Colocasia esculenta (*c-h*; 2); C. odorata (*st*, *sc*; 2); Crassula marginalis (*c-h*); C. rosularis (*c-h*); Crinum asiaticum (*c-h*, tube *g*; 2-2½); C. Balfourii (*st*, tube *g*, *sc*; 1½); C. Careyanum (*st*, tinged *r*; 1); C. giganteum (*st*, *sc*; 2-3); C. Kirkii (*st*, striped *r* at back; 1-1½); C. Macowani (*c-h*, tinged *p*; 2-3); C. purpurascens (*st*, tinged *r* outside; 1-3); Curcuma albiflora (*st*, *w* and *y*; 2); Cyanella odoratissima alba (*c-h*, *sc*; 1); Cyclamen africanum (*c-h*, *w* or tinted *r*, spotted *p*; ¼-½); C. cilicicum (*c-h*, base *p*; ¼); C. neapolitanum (*c-h*, *w* or *r*, *v-p* spot; ¼); C. persicum (*c-h*, blotched *p*; ½); C. varieties (*c-h*); Cycnoches barbatum (*st*, *g-w*, spotted *pi*); Cymbidium Dayanum (*st*, *y-w*, marked *p*); C. eburneum (*i-h*, *iv*, stained *y*, *sc*; 1); C. Mastersii (*i-h*, *iv*, stained *pi*, *sc*); C. Parishii (*st*, *iv*, lip variegated); Cypripedium concolor (*st*, *c*); C. niveum (*st*, freckled *br*; ½); Dahlia imperialis (*c-h*, marked *l* and *r*; 10-12); Dendrobium Ainsworthii (*st*, tinged *pi* and *r-p*, *sc*; 1-2½); D. aqueum (*st*, *c*, lip blotched *y*; 1); D. Bensoniæ (*c-h*, lip marked *o* and *bk*; 1-1½); D. bigibbum candidum (*c-h*; 1); D. Boxallii (*st*, marked *p* and *y*); D. cariniferum (*st*, *g*, *y*, and *r*; 1); D. Devonianum (*st*, marked *pi*, *p*, and *o*) and vars.; D. Draconis (*st*, lip *r* at base; 1-1½); D. endocharis (*st*, lip lined *br*; 1); D. Falconeri (*st*, marked *p*, margined *o*; 1); D. formosum (*st*, throat *o*; 1-1½); D. Fytchianum (*st*, lip *w* and *p-pi*; 1); D. gratiosissimum (*st*, *w*, *pi*, and *y*); D. infundibulum (*st*, *iv*, lip *y*; 1-1½); D. Leechianum (*c-h*, *w* and *pi-p*); D. longicornu majus (*st*, lip marked *y*; 1½); D. moniliforme (*c-h*, lip spotted *p*, *sc*; ¾); D. nobile (*c-h*, marked *pi* and *r*; 2-3); D. Pierardii (*c-h*, *c* or *pi*, lip *y* and

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p); D. scabrilingue (*st*, lip *g*, *y*, and *o*; ½-¾); D. speciosum (*c-h*, *c* or *y-w*; ½-¾); D. teretifolium (lip speckled *bk*); D. transparens (*st*, *w*, marked *p-pi*, *r*, and *y*; 1-1½); D. Wardianum album (*st*, lip *o* at base); D. xanthophlebium (*st*, lip spotted *o*; 1); Dionæa muscipula (*c-h*; ¼-½); Disa megaceras (*c-h*, blotched *pa p* inside; 1-2); Drimiopsis Kirkii (*c-h*; ¾); Drosera binata (*c-h*; ½); Elisena longipetala (*c-h*; 3); Epidendrum bicornutum (*st*, lip spotted *r*; 1-1½); Episcia villosa (*st*, marked *p* within; 1-1½); Eucharis candida (*st*; 2); E. grandiflora (*st*; 2); E. Sanderiana (*st*; 1½); Eurycles Cunninghamii (*i-h*; 1); Freesia refracta (*c-h*); F. r. alba (*c-h*); Galeandra Devoniana (*st*, lip pencilled *pi*; 2); Gladiolus varieties (*c-h*; 1-3); Gloxinia varieties (*st*); Gongora maculata grandiflora (*st*, spotted *pi*; 1½); Guzmannia erythrolepis (*st*, bracts *p-r*; 1-2); G. tricolor (*st*, bracts *y*, *b-p*, and *r*; 1-2); Gymnostachyum ceylanicum (*st*, tipped *g* and *y*); Hechtea argentea (*c-h*); Hedychium coronarium (*st s-aq*, *sc*; 5); Helleborus niger (*c-h*; ½-1½); Hippeastrum vittata (*c-h*, striped *r*); Hyacinthus varieties (*c-h*, *sc*; ¾-1); Hymenocallis amœna (*st*, tube *g-w*, *sc*; 1-2); H. calathinum (*c-h*, tube *g*, *sc*); H. macrostephana (*st*, tube *g*, *sc*; 2); H. speciosa (*st*, *sc*; 1½-2); Impatiens Hookeriana (*st*, striped *p*; 2½); Ixia hybrida (*c-h*; 1); Lælia albida (*i-h*, *c*, lip *w* or *pi*, lined *y*, *sc*); L. anceps alba (*i-h*, lip streaked *y*, *sc*); L. a. Dawsoni (*i-h*, lip marked *p* and *y*, *sc*); L. elegans alba (*i-h*, marked *r-m*); L. majalis var. (*i-h*); L. Wyattiana (*st*, *w*, *p*, and *y*); Lycaste jugosa (*i-h*, lip veined *p*); Masdevallia chelsoni (*c-h*, lip marked *mv*); M. melanopus (*c-h*, dotted *p*, tails *y*); M. tovarensis (*c-h*; ½); Maxillaria grandiflora (*i-h*, lip marked *y* and *r*; ¼-¾); M. luteo-alba (*i-h*, *c*; 1½); M. splendens (*i-h*, lip *o* and *pi*); M. venusta (*i-h*, lip marked *y* and *r*); Miltonia Phalænopsis (*i-h*, lip marked *r* and *y*; ½-¾); Moræa tricuspis (*g-w*; 1); Nelumbium speciosum (*c-h aq*, tipped *pi*, *sc*); Nymphæa Lotus (*st aq*, *w* or *r*); N. thermalis (*st aq*); Odontoglossum cirrhosum (*i-h*, spotted *p*, &c.); O. citrosmum (*i-h*, lip *p*, *sc*); O. crispum (*c-h*, lip *y*, spotted *r-br*) and vars.; O. Oërstedii (*c-h*, marked *y* and *r*); O. Pescatorei (*c-h*, lip marked *p-r* and *y*); O. pulchellum (*i-h*, lip dotted *p*, *sc*); O. Rossii Ehrenbergii (*c-h*, petals barred *br*); Oncidium incurvum (*c-h*, marked *r* and *br*, *sc*; 3); Oxalis variabilis albiflora (*c-h*; ¼); Pachystoma Thomsoniana (*st*, lip *p*; ½); Pelargonium pulchellum (*c-h*, spotted *r*); P. varieties (*c-h*); Peristeria elata (*st*, speckled *l*, *sc*; 4); Phaius albus (*i-h*, lip marked *y* and *pi*; 2); P. Dodgsonii (*i-h*, lip *r* at base); P. irroratus (*i-h*, *c*, tipped *pi*); P. Marshalliæ (*i-h*, lip marked *y*; 2); P. tuberculosus (*i-h*, lip marked *y*, *br*, and *mv*); Phalænopsis amabilis (*st*, lip streaked *y*) and var.; P. amethystina (*st*, lip marked *y*, *b*, and *p*); P. Aphrodite (*st*, lip sometimes streaked *r*, *o*, and *y*); P. Parishii (*st*, *c*, lip *p*); P. P. Lobbii (*st*, *c*, lip banded *br*); P. speciosa (*st*, lip *pi-p*, spotted *y*); P. Stuartiana (*st*, *c*, marked *br*); Plagiolirion Horsmanni (*st*); Podolepis gracilis (*c-h*, *w*, *p*, or *l*; 3); Ranunculus Lyalli (*c-h*; 2-4); Richardia africana (*c-h*, spadix *y*; 2); R. albo-maculata (*c-h*, *g-w*; 2); Romneya Coulteri (*c-h*; 2-4); Saccolabium violaceum Harrisonianum (*st*, *sc*); Sagittaria montevidensis (*i-h*, spotted *r* at base); Sarcochilus Fitzgeraldi (*c-h*, spotted *r*); Schismatoglottis crispata (*st*, *c*, *g* below); Selenipedium Lindeni (*i-h*, marked *g* and *p-r*; 1); S. Schlimii (*i-h*, marked *pi*; 1); Sinningia speciosa vars. (*st*); Siphocampylos coccineus leucostomus (*st*, *w* and *r*; 3); Solanum sisymbriifolium (*c-h*, *w* or *pa b*; 4); Sparaxis grandiflora Liliago (*c-h*; 1-2); S. varieties (*c-h*); Spathiphyllum candidum (*st*; ¾); S. cannæfolium (*st*; 1); Sprekelia formosissima (*c-h*, *w* or *r*, 2); Strelitzia augusta (*i-h*; 10); Streptanthera elegans (*c-h*, tinged *pa pi*, marked *p* and *y*; ¾); Streptocarpus parviflora (*c-h*, faintly streaked *p*; ½-¾); Theropogon pallidus (*c-h*, sometimes tinged *r*; 1); Thunbergia erecta alba (*st*, tube *y*; 6); T. fragrans (*st*, *sc*); Tillandsia pulchra (*st*, bracts *r*); T. regina (*st*, *sc*, bracts *pi*; 7); T. virginalis (*st*, *w*); T. xiphioides (*st*); Trichopilia nobilis (*i-h*, lip blotched *o*, *sc*);

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T. suavis (*i-h*, *w* or *c*, lip marked *v pi* and *y*, *sc*); Utricularia montana (*st*, marked *y*); Vanda Hookeriana (*st*, marked *pi*, *m*, and *p*); Xanthorrhœa Preissii (*c-h*; 5-6); Xanthosia rotundifolia (*c-h*; 1-2); Yucca aloifolia (*c-h*; 15-20); Zephyranthes candida (*c-h*, *g* at base; ¼-¾); Zygopetalum candidum (*st*, lip *pi-p* and *w*; ¾); Z. Dayanum (*st*, marked *g* and *p-v*); Z. triumphans (*st*, marked *b*); Z. Wallisii (*c-h*, marked *v*).

YELLOW.—The shades are indicated by the following abbreviations: *bu* (buff), *chr* (chrome), *ci* (citron), *d* (dark), *go* (golden), *le* (lemon), *n* (nankeen), *o* (orange), *pa* (pale), *str* (straw), *su* (sulphur).

Hardy.—ANNUALS.—Amarantus caudatus var. (2-3); Argemone ochroleuca (*pa*; 1½); Bartonia albescens (or biennial) (*pa*; 1-4); B. aurea (*go*; 1); Bivonæa lutea (¼-½); Calendula maderensis (*o*; 2); C. officinalis (*o*; 3); Castilleja indivisa (*g-y*, bracts *r*; ½-1); Centaurea suaveolens (*sc*; 1½); Cerinthe minor (sometimes spotted *br*; 1-1½); Chlora perfoliata (*go*; 1); Chrysanthemum coronarium (4); C. segetum (1½); C. s. grandiflorum (1½); Collomia grandiflora (*r-y*; 1½-2); Coreopsis Drummondi (*r-br* circle; 1); C. tinctoria (*p-br* blotch; 2); Erysimum Perofskianum (*r-o*; 1); Gilia micrantha aurea (*go*; ¾); Helianthus annuus (6) and vars.; Limnanthes Douglasii (passing to *w*, streaked *gy*; ¾); Linaria spartea (*d*); Loasa Pentlandii (*o*; 4); L. prostrata; Lupinus luteus (*sc*; 1-1½); Madia elegans (1½); Nigella orientalis (spotted *r*; 1½); Œnothera bistorta Veitchiana (spotted *r*); Oxalis corniculata; O. valdiviensis (streaked *r*; ½-¾); Podolepis aristata (*go*, ray *pi*; 1); Selenia aurea (*g-y* and *go*; ¾); Tropæolum majus vars.; T. peregrinum; Ursinia pulchra (*o*; 1); Vesicaria grandiflora (1).

BIENNIALS.—Bartonia albescens (or annual) (*pa*; 1-4); Centaurea Fenzlii (4); Chlora grandiflora (*go*; ½-1); Eschscholtzia californica crocea (*o*, &c.; 1); Fœniculum dulce (4); Glaucium flavum (1-2); Grindelia grandiflora (*y* or *o*; 2½-3); Meconopsis nepalensis (*pa go*; 3-5); Œnothera biennis (*pa*; 2-4); Scrophularia chrysantha (*go*; ½-1½); Verbascum Chaixii (3).

PERENNIALS.—Achillea ægyptiaca (1½-2½); A. aurea (*go*; 1½); A. Eupatorium (4-5); A. tomentosa (½-1); Aconitum Anthora (*pa*; 1-2); A. A. nemorosum (3); A. pyrenaicum (2); A. vulparia (*pa*; 1-3); Acorus Calamus; Actinella grandiflora (½-¾); Actinomeris helianthoides (3); A. procera (8); A. squarrosa (3); Adonis pyrenaica (1-1½); A. vernalis (¾-1); Agrimonia odorata (*sc*; 2-3); Aletris aurea (1-2); Allium Moly (¾-1¼); Alstrœmeria aurantiaca (*o*, streaked *r*; 3-4); A. versicolor (marked *p*; 2-4); Alyssum alpestre (¼); A. gemonense (1); A. orientale (1); A. saxatile (1) and var.; A. serpyllifolium (*pa*; ¼); A. Wiersbeckii (*d*; 1½); Anemone alpina sulphurea (1); A. decapetala (*pa*, or *c*; 1); A. multifida (*pa*, or *r*; ½-1); A. palmata (*go*; ¾); A. patens (*y* or *p*; 1); A. ranunculoides (¼); Anthemis Biebersteinii (1-2); Anthyllis Vulneraria (variable; ½); Aquilegia chrysantha (*pa*, tipped *r-p*; 3-4); Arnebia echioides (spotted *p*; ¾-1); Arnica Chamissonis (1-2); A. foliosa (*pa*; 1-2); A. montana (1); A. scorpioides (½-1); Artemisia alpina (½-¾); A. argentea (*pa*; 1½); Asclepias tuberosa (*o*; 1-2); Asphodelus creticus (2); Astragalus alopecuroides (2-5); A. canadensis (2-3); A. galegiformis (*pa*; 3-5); A. glycyphyllos (*su*; 2-3); A. leucophyllus (*pa*; 2-3); A. maximus (2-3); A. vulpinus (*pa*; 2-3); Baptisia perfoliata (3); B. tinctoria (2-3); Brodiæa gracilis (*d*, nerved *br*; ¼); Buphthalmum grandiflorum (1½); B. salicifolium (1½); B. speciosissimum (2); Bupleurum graminifolium (*g-y*; ½); Calliprora lutea (marked *p-br*; ¾); Caltha palustris (*s-aq*, *go*; 1); C. radicans (*s-aq*; ½); Campanula thyrsoidea (*su*; 1-1½); Cassia marylandica (2-3); Centaurea alpina (3); C. babylonica (6-10); C. macrocephala (3); Cerinthe maculata (spotted *p*; 1-1½); Cheiranthus Cheiri vars. (*sc*; 1-2); Chrysanthemum varieties; Chrysobactron Hookeri (1½-3); C. Rossii (2-3); Chrysogonum virginianum (½); Cineraria aurantiaca (*o*; ½); C. longifolia (2); Cnicus spinosissimus (*pa*; 3); Colchicum luteum (¼); Coreopsis auriculata (*p-br* band; 1-1½); C. grandiflora (3-4); C. lanceolata (1-3); C. verticillata (*go*; 1-2); Coronilla iberica; Corydalis bracteata (*su*; ¾); C. lutea (1); C. Marschalliana (*su*; ¾); C. nobilis (*pa*, tipped *g*; ¾); C. sibirica (1-3); Crocus aureus (*o*; ¼); C. susianus (*o*; ¼); C. varieties; Dahlia varieties; Datisca cannabina (3-6); Dianthus Caryophyllus vars. (*sc*; 1½-2); Dicentra chrysantha (*go*; 3-5); D. thalictrifolia (*sc*); Digitalis ambigua (reticulated *br*; 2-3); Diotis maritima (½-1); Doronicum altaicum (1); D. austriacum (1-1½); D. caucasicum (1); D. Pardalianches (1½-3); D. plantagineum excelsum (5 or more); Draba aizoides (¼); D. Aizoon (¼); D. alpina (*go*; ¼); D. glacialis (*go*; ¼); Epimedium pinnatum (¾-2); Eranthis hyemalis (¼-¾); E. sibiricus (¼); Eremurus spectabilis (*su*; 1); Erigeron aurantiacus (*o*; 1); Erysimum alpinum (*su*; ½); E. ochroleucum (*pa*); E. pumilum (*pa su*, *sc*; ¼); Erythronium americanum (¼-½); Ferula asparagifolia (4-5); F. communis (8-12); F. glauca (6-8); F. tingitana (6-8); Fœniculum vulgare (6); Fritillaria armena (½); F. imperialis (varying to *r*; 3); F. i. lutea (3); F. i. sulphurine (*su*; 3); F. pallidiflora (¾); F. pudica (*d*; ½-¾); Gagea lutea (½); Gaillardia aristata (1½); Gentiana lutea (4-6); G. punctata (dotted *p*; 1-2); Geum elatum (*go*); G. montanum (½-1); G. pyrenaicum (1½); Gilia Brandegei (*go*; ¾-1); Gratiola aurea (*go*; ⅓); Habenaria cristata (*go*; 1); Hacquetia Epipactis (¼-½); Helenium autumnale (4-6); Helianthemum vulgare vars.; Helianthus orgyalis (6-10); H. rigidus (*go*; 3); Helichrysum arenarium (*go*; ½-1); Hemerocallis Dumortieri (*o*, tinged *br*; 1-1½); H. flava (*o*, *sc*, 2-3); H. fulva (2-4); H. Middendorfi (2-3); H. minor (tinged *g*; ½-¾); Humulus Lupulus (*g-y*); Hyacinthus varieties (*sc*; ¾-1); Hypericum elegans (1); H. patulum (6); H. perforatum (1-3); Inula glandulosa (2); I. Hookeri (*pa*, *sc*; 1-2); Iris aurea (3-4); I. Chamæiris (marked *br*; ¼-½); I. flavescens (*le*, marked *p-br* and *o*, 2-3); I. lutescens (*pa*; ½); I. Monnieri (*le*, *sc*; 3-4); I. ochroleuca (*y* and *w*; 3); I. Pseudo-acorus (*s-aq*; 2-3); Leptinella dioica (*pa*; ¼); Lilium canadense (spotted, varying to *r*; 1½-3); L. chalcedonicum (*y* or *r*; 2-3); L. croceum (*go*, tinted *r*; 3-6); L. Hansoni (*r-o*; 3-4); L. monadelphum (*pa*, tinged *r* at base; 3-5); L. Parryi (*pa*, dotted *br-r*, *sc*; 2-6); L. pyrenaicum (2-4); Limnanthemum nymphæoides (*aq*); Linaria dalmatica (3-4); Lotus corniculatus (fading to *o*); Lysimachia ciliata (*pa*; 2-3); L. Nummularia; L. punctata (1); L. vulgaris (2-3); Meconopsis cambrica (*pa*; 1); Mimulus moschatus; M. primuloides; Mitella pentandra (½); Morina Coulteriana (*pa*; ½-1½); Narcissus Bulbocodium (½-¾); N. calathinus (*pa*, or *w*; ¾-1); N. incomparabilis (1); N. Jonquilla (*sc*; ¾-1); N. Pseudo-Narcissus (*su*, crown *o*; 1); N. varieties; Nuphar advena (*aq*, anthers *r*); N. luteum (*aq*, *sc*); Œnothera glauca (*pa*; 1-2) and var.; Œ. linearis (¾-1½); Œ. missouriensis latifolia; Ononis Natrix (veined *r*; 1½-2); Onosma stellulata tauricum (½-¾); Orobus aurantius (*d*; 1½); Oxalis lobata (spotted *r*; ¼); Pæonia Wittmanniana (*pa*; 2); Papaver alpinum (*y*, *pi*, or *w*; ½); P. nudicaule (*o*, *y*, or *w*; ¾-1½); Pedicularis dolichorhiza (*go*; 1-1½); P. Sceptrum Carolinum (*go*; 3-4); Pentstemon antirrhinoides (*le*; ¾-1½); P. breviflorus (*y* or *pi*, striped *pi* within; 3-6); P. confertus (*su*; ½-1½); P. deustus (1); Polygonum sachalinense (*s-aq*, *g-y*; 10-12); Potentilla alpestris (½-1); P. ambigua (½); P. argyrophylla (1½-3); Primula Auricula (¼); P. luteola (*s-aq*; 1½-2); P. officinalis vars. (¼-1); P. sikkimensis (*pa*; 1½-2); P. Stuartii (*go*; ¾-1½); P. vulgaris (*pa*; ¼); Pyrethrum achilleæfolium (*go*; 2); Ranunculus as aticus vars. (*y* or *o*; ¾); R. cortusæfolius (2); R. gramineus (½-1); Rudbeckia grandiflora (disk *p*; 3½); R. maxima (4-9); R. pinnata (*pa*; 3); R. speciosa (*o*, disk *bk p*; 2-3); Saxifraga aizoides (*o* or *go*; ½-¾); S. aretioides (*go*; ¼); S. diversifolia (½-1¼); S.

Yellow (Hardy Perennials)—*continued.*

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Hirculus (dotted *r* at base; ¼-½); S. moschata (*pa y* or *p*; ¼); S. pygmæa (⅛); S. sancta; Scabiosa Webbiana (*c-y*; ½); Scolymus grandiflorus (3); Scorzonera hispanica (3); Scutellaria alpina lupulina; Sedum Aizoon (1); S. japonicum (¼); S. kamtschaticum (½); S. reflexum (¾); Sempervivum arenarium (*pa*; ½-¾); S. Braunii (½-¾); S. Heuffelii (*pa*, calyx turning *r-br*; ½-¾); S. soboliferum (*pa*; ¾-1); Senecio Doria (4); S. Doronicum (1); Silene Saxifraga (*r-br* beneath; ¼-½); Silphium laciniatum (3-6); Solidago Drummondii (1-3); S. lanceolata (2-3); S. speciosa (3-6); Stachys Maweana (*pa*, blotched *p*; 1); Sternbergia lutea (½-1); S. l. sicula (½-1); Stylophorum diphyllum (*d*; 1); Tanacetum leucophyllum (*go*; ¾); Thermopsis montana (1-2); Tritonia Pottsii (flushed *r* outside; 3-4); Trollius europæus (*pa*; ½-2); Tropæolum polyphyllum; Tulipa retroflexa; T. sylvestris (*sc*; 1-2); T. varieties; Uvularia grandiflora (*pa*; ¾-1); U. sessilifolia (¾-1); Vesicaria utriculata (1); Viola Munbyana lutea; V. tricolor vars.; Waldsteinia fragarioides.

Half-hardy.—Annuals.—Callistephus chinensis vars. (½-2); Datura chlorantha flore-pleno (*sc*); Gomphrena globosa aurea superba (1½); Helichrysum bracteatum vars. (3-4); Helipterum Humboldtianum (1-2); Lindheimera texana (1-2); Mentzelia bartonioides (*su*; 1); Mimulus luteus (*d* marks; ¾-1); Mirabilis Jalapa (*y*, *w*, or *r*; 2); Momordica Charantia; Tagetes erecta (2); T. patula vars. (1½); T. tenuifolia (2); Zinnia elegans (*bu*; 2).

Perennials.—Abronia arenaria (*le*, *sc*; ¾-1½); Amicia Zygomeris (splashed *p*; 8); Arctotis acaulis (*y* and *r*; ½); A. grandiflora (*o*; 1½); A reptans (*o* and *w*; ¾); A. speciosa (1½); Calceolaria amplexicaulis (1½); C. Fothergillii (¼-½); C. varieties; Centaurea ragusina (2); Collinsonia anisata (*pa*; 2-3); Cypella Herberti (1); Gladiolus purpureo-auratus (*go*, blotched *p*; 3-4); G. varieties (1-3); Hedychium Gardnerianum (*le*; 3-5); Lilium japonicum (tinged *p* outside; 4-5); L. Krameri (tinged *r*, *sc*; ¼); Neja gracilis (1); Othonnopsis cheirifolia (¾-1); Sarracenia flava (2); Satyrium coriifolium (1); Tigridia pavonia (*go-o*; 1-2); Tropæolum tricolorum Regelianum; Viola pedunculata (*d*); Zephyranthes Andersoni (*go* or *br*; ¼).

Tender.—Annuals.—Oxalis Barrelieri (*c-h*, spotted *o*; ¾-1); Salpiglossis sinuata vars. (*c-h*; 2); Thunbergia alata aurantiaca (*st*, *d*); Torenia flava (*st*, *p* eye; ½-¾); Waitzia aurea (*c-h*, *go* or tinged *br*; 1-2); W. nivea (*c-h*, *pa y*, *pi*, or *w*; 1½).

Perennials.—Acineta densa (*c-h*, *le*, dotted *br*, *sc*); A. Humboldtii (*c-h*, *str*, dotted *br*; 1); Æchmea calyculata (*st*, bracts *r*; ¾); Æschynomene aspera (*st*; 6-8); Aglaonema pictum (*st*, 1-2); Albuca angolensis (*c-h*; 3); A. aurea (*c-h*, *pa*; 2); A. flaccida (*c-h*, *pa*, *g* keel; 2); Amomum angustifolium (*st*, *chr* or *r*; 8); Angræcum citratum (*st*, *pa*, or *c*); A. Kotschyi (*st*, *pa*, spur *r*, *sc*); Anguloa Clowesii (*c-h*, *go*, lip *w*, *sc*; 1½); Anigozanthus flavidus (*c-h*, *g-y*; 3); A. pulcherrimus (*c-h*; 3); Ansellia africana (*st*, spotted *br-r*; 2); A. a. gigantea (*st*, *pa*, barred *br*, *sc*; 2); A. a. nilotica (*st*, spotted *br-r*); Aspasia epidendroides (*st*, *pa*; 1); A. papilionacea (*st*, marked *br* and *v*; ¾); Babiana stricta sulphurea (*c-h*, *pa*, or *c*; ¾); Begonia Pearcei (*i-h*; 1); B. xanthina (*i-h*, *go*; 1); B. varieties (*i-h*); Bifrenaria aurantiaca (*st*, *o*; ¾); Blandfordia aurea (*c-h*, *go*; 1-2); B. flammea (*c-h*; 2); B. nobilis (*c-h*, *o*, margined *y*; 2); Bomarea Caldasiana (*c-h*, *o-y*, spotted *r*); Brassavola glauca (*i-h*, lip *o*, throat *w*; 1); Brassia antherotes (*i-h*, marked *bk-br* and *br*); B. caudata *i-h*, marked *br*; 1); B. Lanceana (*i-h*, blotched *br*, *sc*; ¾); B. L. macrostachya (*i-h*, spotted *br*, *sc*; ¾); B. Lawrenceana (*i-h*, marked *br* and *g*, *sc*; 1); B. L. longissima (*i-h*, *o* and *pa*, marked *p*; 1); B. maculata guttata (*i-h*, *y-g* and *y*, blotched *br*; 1); Bromelia Fernandæ (*st*, bracts *o-r*; 2); Brunsvigia Cooperi (*i-h*, *su*, edged *r*; 1½); Bulbine aloöides (*c-h*; 1); B. caulescens (*c-h*; 2); Bulbophyllum Lobbii (*st*, spotted *p*; ½); B. siamense (*st*, striped *p*); Calanthe Petri

Yellow (Tender Perennials)—*continued.*

(*st*, *pa*); C. Sieboldii (*st*; 1); Calceolaria plantaginea (*c-h*; 1); C. varieties (*c-h*); Callipsyche aurantiaca (*c-h*, *go*; 2); C. mirabilis (*c-h*, *g-y*; 3); Calochortus Benthami (*c-h*; ¼-½); C. luteus (*c-h*, *y* and *g*; 1); C. pulchellus (*c-h*; 1); Camaridium ochroleucum (*st*, *pa*; 1); Canarina Campanula (*c-h*, *o* or *y-p*; 3-4); Canistrum aurantiacum (*st*, *o*); Canna Depute Henon (*st*, *pa*; 4); C. zebrina (*st*, *o*; 6-8); Caraguata Van Volxemii (*st*; 2-3); C. Zahnii (*st*, *pa*; 1); Catasetum callosum (*st*, *br-y*; 1); Cattleya amethystoglossa sulphurea (*i-h*, *y* and *c*, spotted *p*; 2-3); C. citrina (*i-h*, *le*; 1); C. Dowiana (*i-h*, *n*, lip *p*, *pi*, and *y*); C. Trianæ velutina (*i-h*, *pa o*, marked *v* and *p*, *sc*); Centrosolenia bullata (*st*, *str*); Chondrorhyncha Chestertoni (*st*); C. fimbriata (*st*, *su*, spotted *br*); Chysis aurea (*st*, marked *r*; 1); C. chelsoni (*st*, *n*, marked *pi* and *r*; 1); C. lævis (*st*, lip blotched *r*; 1); Cirrhæa Loddigesii (*st*, *g-y*, marked *r*; ¾); Cirrhopetalum aureum (*st*, *str*, marked *go* and *r*; ½); C. Medusæ (*st*, *pa str*, dotted *pi*; ½); C. Thouarsii (*st*, dotted *r*; 1); Cleisostoma (*st*, *su*, *o*, and *go*, marked *br*); Cœlogyne plantaginea (*i-h*, *g-y*, lip *w* and *br*; 1½); C. Schilleriana (*i-h*, lip blotched *p*; ½); Costus Malortieanus (*st*, *go*, banded *o-r*; 1-3); Curcuma australasica (*st*); C. cordata (*st*, *r-y*; 1); C. petiolata (*st*, *pa*; 1½); Cycnoches aureum (*st*, *pa*; 1); C. Lehmanni (*st*, *o*, sepals *pi*); Cypripedium Druryi (*st*, lip spotted *y*; ½); Cyrtochilum citrinum (*st*, *ci*); Dendrobium aggregatum (*c-h*, *d*; ¼); D. Aphrodite (*c-h*); D. aureum (*c-h*, lip marked *br* and *p*; 1); D. Brymerianum (*st*; 2); D. chrysanthum (*c-h*, *d*, *r* blotch; 1); D. chrysotis (*st*, *go* and *o*; 2-6); D. clavatum (*st*, *r* spot; 1-3); D. crassinode (*st*, marked *p* and *o*); D. Dalhousianum (*st*, *bu* and *le*, marked *r* and *pi*; 3-5); D. densiflorum (*st*; 1); D. erythroxanthum (*st*, *o*, striped *p*; 3-4); D. fimbriatum (*st*, *o*; 2-4); D. f. oculatum (*st*, *o*, blotched *p* or *r*; 2-4); D. Jenkinsii (*c-h*, *bu* and *pa*); D. luteolum (*c-h*, *pa*; 1-2½); D. macrophyllum (*st*, *g-y*, lip marked *p*); D. suavissimum (*st*, *br-p* blotch; 1); Epidendrum alatum majus (*c-h*, *pa*, lip striped *p*); E. aurantiacum (*st*, *o*, lip striped *r*; 1); E. falcatum (*st*, *g-y* and *y*, *sc*; 2); Fragaria indica (*c-h*, *go*); Galaxia ovata (*c-h*; ½); Galeandra Baueri lutea (*st*, lip lined *p*; ½); Geissorhiza inflexa (*c-h*, spotted *p*; 1½); Gladiolus varieties (*c-h*; 1-3); Globba atrosanguinea (*st*, bracts *r*; 1-1½); G. Schomburgkii (*st*, *go*, lip *o-r* at base; ½-1); Gloxinia varieties (*st*); Gongora maculata (*st*, spotted *pi-r*; 1½); Gynura aurantiaca (*c-h*, *o*; 2-3); Hedychium flavosum (*st*, *sc*; 2-3); H. flavum (*c-h s-aq*, *o*, *sc*; 3); Heliconia psittacorum (*st*, *o*; 3); Hippeastrum equestre fulgida (*i-h*, *o*, margined *w*; 1); H. e. major (*i-h*, *o*, starred *g*; 1); H. e. flore-pleno (*i-h*, *o*; 1); Hyacinthus varieties (*c-h*, *sc*; ¾-1); Imantophyllum Gardeni (*c-h*, *r-o* or *y*; 1-2); I. miniatum (*st*, *d o*, *bu* below; 1-2); Isoloma hondense (*st*, *r*-hairy; 1); Ixia maculata (*c-h*, *o*; 1); I. odorata (*c-h*, *sc*; 1); Lachenalia Nelsoni (*c-h*, *go*); Lælia xanthina (*i-h*, *go*, lip *w* and *o*; ¾); Limnocharis Plumieri (*i-h aq*; 1½); Littonia modesta (*i-h*, *o*; 2-6); Lycaste aromatica (*st*); Lycoris aurea (*c-h*, *go*, 1); Manulea rubra (*c-h*, *go*; 1-2); Maranta concinna (*st*); Masdevallia Davisii (*c-h*, *o*); M. ionocharis (*c-h*, *w-y*, blotched *p*; ½); Microstylis calophylla (*st*); M. discolor (*st*, turning *o*); Miltonia flavescens (*i-h*, lip spotted *r*); Mimulus luteus (*c-h*; ¾-1); Mormodes Ocanæ (*st*, *o*; 1); M. pardinum (*st*, spotted *br*); Musschia aurea (*c-h*, *go*; 1-2); Nelumbium luteum (*c-h aq*, *sc*); Odontoglossum cristatum (*c-h*, marked *br* or *p*); O. Lindenii (*c-h*; 2-3); O. Londesboroughianum (*c-h*, *pa*); O. Schillerianum (*c-h*, marked *br* and *p*); O. Wilckeanum (*c-h*, *pa*, blotched *br*); Oncidium ampliatum (*st*); O. calanthum (*i-h*, lip stained *r*); O. Cavendishianum (*st*); O. concolor (*c-h*, *go*); O. cornigerum (*c-h*, spotted *r*); O. divaricatum (*i-h*, *y*, marked *br*; 1½); O. excavatum (*i-h*, *go*, marked *br*); O. flexuosum (*i-h*, spotted *br*); O. Marshallianum (*i-h*, *go*, marked *br*); O. oblongatum (*i-h*); O. rupestre (*i-h*, *go*, spotted *br*; 2); O. varicosum Rogersii (*i-h*, *go*); O. Warscewiczii (*c-h*, *go*, lip marked *w* and *br*); Ornithogalum thyrsoides (*c-h*; ½-1½) and vars.; Peristeria pendula (*st*, *pa*, spotted *r* and

Yellow (Tender Perennials)—*continued.*

br; 1); Phaius Wallichii (*i-h*, *o* or *bu*, tinged *p*; 4-5); Phormium Cookianum (*c-h*; 3-6); P. tenax (*c-h*, *y* or *r*; 6) and vars.; Physalis peruviana violacea (*c-h*, spotted *p* at base; 3); Pitcairnia xanthocalyx (*st*; 1½-2); Pogonia Fordii (*i-h*, nerved *br*, lip *w*); Prepusa Hookeriana (*c-h*, *pa*; 1); Primula Boveana (*c-h*; ½); P. floribunda (*c-h*, *y*; ½); P. verticillata simensis (*c-h*; 1-1½); Richardia melanoleuca (*c-h*, *pa*, *bk-p* spot at base, spadix *w*; 1½); Saccolabium acutifolium (*st*, lip *pa pi*); S. bigibbum (*st*, lip *w* and *y*); Sandersonia aurantiaca (*c-h*, *o*; 1½); Scuticaria Steelii (*st*, *pa*, lip marked *br-r* and *o*); Sedum sarmentosum (*c-h*); Sempervivum aureum (*c-h*; 1); Sinningia conspicua (*st*, marked

Yellow (Tender Perennials)—*continued.*

p; 1); Sparaxis tricolor (*c-h*, *o* and *y*, spotted *bk*; 1-2); S. varieties (*c-h*); Spathoglottis Fortunei (*st*, lip blotched *r*); S. Lobbii (*st*, *su*, marked *br*); S. pubescens (*st*, lip marked *v*); Stenomesson vitellinum (*i-h*; 1); Stylidium spathulatum (*c-h*, *pa*; 1½); Tillandsia Saundersii (*st*, *su*; 1½); T. splendens (*st*, bracts *p*); Tritonia crocata (*c-h*, *pa*; 2); Tropæolum Lobbianum (*c-h*, *o*); T. peregrinum (*c-h*); Turnera ulmifolia (*st*; 2-4); Utricularia bifida (*c-h*); Villarsia parnassifolia (*c-h*; 1-2); V. reniformis (*c-h*; ½-3); Wachendorffia thyrsiflora (*c-h*; 2); Warrea tricolor (*st*, *pa*, lip *p* and *w*; 2); Zephyranthes citrina (*i-h*; ½-1); Zygopetalum citrinum (*i-h*, lip marked *bk* and *r*).

SHRUBS AND SUB-SHRUBS.

IN gardens of any pretensions Shrubs are indispensable, both for indoor and for outdoor cultivation. A Shrubbery is now generally considered a necessary item in any large establishment, and the best subjects, both evergreen and deciduous, may be chosen by means of the following lists. The height attained by the various species is in most cases appended to the description, the figures denoting feet: this should be found of much service to persons desirous of making a selection of Shrubs for massing, or for growing as isolated specimens on lawns, &c. By means of this information, suitable plants can also be chosen to serve as a background to herbaceous borders, and for similar purposes.

A good list of tender evergreens is given, and will be found useful when selecting plants for the winter decoration of Conservatories and other Glass-houses.

For borders, some of the dwarf-growing, hardy evergreens here enumerated are especially desirable in winter, as in such positions there are then very few herbaceous subjects showing signs of growth, with the exception of bulbous plants such as *Crocus*, *Galanthus*, &c.

The lists of Deciduous and Evergreen Climbers will be of service where it is desired to cover walls or dead tree-trunks, or to form arbours, screens, &c.; and the Trailers may prove of use for planting in Rockeries, or for interspersing with erect-growing subjects in Shrubberies, &c.

For full information as to the general treatment of Shrubs, the reader is referred to the article "Shrubs and Shrubberies" in Vol. III.

The following are the abbreviations employed:—

aq, aquatic; *b*, blue; *bk*, black; *br*, brown; *c*, cream; *c-h*, cool-house; *fl*, flowers; *fol*, foliage; *fr*, fruit; *g*, green; *gl*, glaucous; *gy*, grey; *i-h*, intermediate-house; *l*, lilac; *m*, magenta; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *s-aq*, semi-aquatic; *sc*, scented; *si*, silvery; *st*, stove; *v*, violet; *w*, white; *y*, yellow.

Where not otherwise specified, the leaves are green. Plants of a sub-shrubby nature are here indicated by an asterisk.

DECIDUOUS.—Hardy.—Acæna microphylla* (*fl g* and *r*; ½); A. millefolia*; A. myriophylla* (½-1); A. pulchella* (*fol* bronzy); Acer circinatum (*fl r*; *fol r* in autumn; 5-6); A. heterophyllum (4); A. japonicum vars. (*fl p-r*; 1½-3); A. opulifolium (8); A. o. obtusatum; A. palmatum vars.; Adenocarpus hispanicus (*fl y*; 2-4); A. intermedius (*fl y*; 3-4); A. parvifolius (*fl y*; 3-4); A. telonensis (*fl y*; 2-4); Alyssum saxatile* (*fl y*; ½) and var.; A. serpyllifolium* (*fl y*; ¼); Amelanchier vulgaris (*fl w*; 3-9); Amorpha canescens (*fl b*; 3); A. fruticosa (*fl b-p*; 6); Amygdalus incana (*fl r*; 2); A. nana (*fl pi*; 2-3); Artemisia Abrotanum (*fl y*; *fol sc*; 2-4); Asimina triloba (*fl p* and *y*; 10); Azalea arborescens (*fl r*; 10-20); A. calendulacea (*fl y*, *r*, *o*, and *br*; 2-6); A. nudiflora (*fl r-pi*; 3-4); A. pontica (*fl y*; 4-6); A. speciosa (*fl r* and *o*; 3-4); A. viscosa (*fl w*, *sc*; 2-4) and var.; Betula fruticosa (*fl w-br*; 5-6); B. nana (*fl w-g*; 1-3); B. pumila (*fl w*; 2-3); Calophaca wolgarica (*fl y*; 2-3); Calycanthus floridus (*fl p*, *sc*; 4-6); C. glaucus (*fl p*; 4-6); C. lævigatus (*fl p*; 3-6); C. occidentalis (*fl r*, *sc*; 6-12); Calycotome spinosa (*fl y*; 5-6); Caragana frutescens (*fl y*; 2-3); C. jubata (*fl w*, suffused *r*; 1-2); C. spinosa (*fl y*; 4-6); Cephalanthus occidentalis (*fl w-y*; 7); Cerasus pseudo-cerasus (*fl w*; *fr r*; 6-10); Chimonanthus fragrans (*fl w* or *y* and *p*, *sc*); Chionanthus virginica (*fl w*, *sc*; 10-30); Clematis aromatica (*fl v-b*, *sc*; 4-6); Clethra acuminata (*fl w*, *sc*; 10-15); C. alnifolia (*fl w*; 3-4); C. paniculata (*fl w*, *sc*, 3-4); C. tomentosa (*fl w*; 3-4); Colutea arborescens (*fl y*; 6-10); C. cruenta (*fl r-y*; 4-6); Comptonia asplenifolia (*fl w*; 3-4); Cornus paniculata (*fl w*; 4-8); C. sanguinea (*fl g-w*; 6-8); C. sericea (*fl w*; 5-8); C. stricta (*fl w*; 8-15); Corylopsis spicata (*fl y*, *sc*; 3-4); Corylus Avellana vars.; C. tubulosa vars.; Cotoneaster vulgaris (*fl r*; *fr r*; 3-5); Cratægus Crus-galli ovalifolia (*fl w*; 10-20); C. C.-g. prunifolia (*fl w*; 15-20); C. Douglasii (*fl w*; 10-15); C. flava (*fl w*; 12-20); C. heterophylla (*fl w*; 10-20); C. nigra (*fl w*; 10-20); C. odoratissima (*fl w*, *sc*; 10-20); C. orientalis (*fl w*; 12-20); C. Oxyacantha (*fl w*, sometimes *pi*, *sc*; 10-20) and vars.; C. tanacetifolia (*fl w*; 12-20); Cydonia (Pyrus) japonica (*fl r*; 5-6); C. (Pyrus) Maulei (*fl r*); Daphne Mezereum (*fl r*; 3-4); Deutzia corymbosa (*fl w*; 5); D. crenata (*fl w*; 4-8); D. gracilis (*fl w*; 1-2); Diervilla grandiflora (*fl pi*; 8) and vars.; D. rosea (*fl pi* or *w*; 6) and vars.; Dimorphanthus mandschuricus (6-10); Dirca palustris (*fl y*; 2-5); Enkianthus japonicus (*fl w*; *fol* becoming *y-o*); Euonymus atropurpureus (*fl p*; 6-14); E. europæus (*fl g-w*; 6-20); E. latifolius (*fl w* to *p*; 6-8); Forsythia suspensa (*fl y*); F. viridissima (*fl y*; 10); Fothergilla alnifolia (*fl w*, *sc*; 3-6); Fremontia californica (*fl y*; 6-10); Gordonia pubescens (*fl w*, *sc*; 4-6); Halimodendron argenteum (*fl p*; 4-6); Hamamelis virginica (*fl y*; 12); Hibiscus syriacus (6) and vars.; Hippophae rhamnoides (*fl y*; 2-20); Hydrangea hortensis (2-3) and vars.; H. paniculata grandiflora (*fl w*); Hypericum calycinum (*fl y*; 1); Iberis Tenoreana* (*fl p* or *w*; ½); Kerria japonica (*fl o-r*; 3-4); Leycesteria formosa (*fl w*, tinged *pi*; 4-6); Lonicera tatarica (*fl pi*; 4-6); Magnolia parviflora (*fl w*, tinged *pi*); Microglossa albescens* (*fl b* or *w*); Nuttallia cerasiformis (*fl w*; 5); Ononis rotundifolia* (*fl pi*; 1-1½); Pæonia Moutan (*fl* variable; 3); Parrotia persica (*fol* becoming *o* or *y* and *g*; 10); Pavia alba (*fl w*; 3-9); P. californica (*fl w* or *pi*, *sc*; stamens *o*; 12-15); Philadelphus coronarius (*fl w*, *sc*; 2-10); P. Gordonianus (*fl w*; 10); P. grandiflorus (*fl w*, *sc*; 10); P. hirsutus (*fl w*; 3); P. inodorus (*fl w*; 4-6); Potentilla fruticosa (*fl y*; 2); Prunus cerasifera (*fl w*); P. Pissardii (*fl w*); P. triloba (*fl w* or *pi*; 6); Pyrus arbutifolia (*fl w* or tinged *p*; 2-10); P. Aria (*fl w*; 4-40); P. Chamæmespilus (*fl r*; 5-6); P. floribunda (*fl pi-r*); P. Toringo (*fl w* or tinged *pi*); Rhododendron dahuricum (*fl pi*; 3); Rhodora canadensis (*fl pi-p*, rarely *w*; 2-4); Rhus Cotinus (*fl p* or *pi-w*; 6-8); R. glabra (*fl g-y* or *g-r*; 5-18) and var.; R. typhina (*fl g-y*; 10-30); Ribes aureum (*fl y*; 5-8); R. floridum (*fl w*; *fr bk*; 4); R. gracile (*fl w*; *fr p*; 4-5); R. Grossularia (*fl g*; *fr*; 4); R. lacustre (*fl g-y*; 4); R. nigrum (*fl g*; *fr bk*; 5); R. oxyacanthoides (*fl g*; *fr r* and *g*, or *p-b*; 2-3); R. rubrum (*fl g*; *fr r*; 4); R. sanguineum (*fl pi*; *fr p*, with *gl* bloom; 4-8); R. speciosum (*fl r*; *fr r*; 6-8); Robinia hispida (*fr pi*; 3-8); Rosa acicularis (*fl w-pi*, *sc*; 8); R. alba (*fl w* or *w-pi*, *sc*; 4-7); R. alpina (*fl pi* or *pi-r*; 3); R. blanda (*fl pi*; 1-3); R. bracteata (*fl w*; 2); R. canina (*fl* usually *pi*; *fr r*; 6-8); R. centifolia (*fl pi-p*, *sc*; 3-6); R. c. muscosa (*fl pi* or *w*); R. damascena (*p w* or *r*, *sc*; 2-4); R. gallica (*fl r*; 2-3); R. hemisphærica (*fl y*; 3); R. indica (*fl r*; 4-20); R. lucida (*fl r*; 1-2); R. lutea (*fl y*; 3); R. mollis pomifera (*fr r*); R. nitida (*fl r*; *fol* becoming *p*; 2); R. rubiginosa (*fl pi*; 5; plant *sc*); R. rugosa (*fl r*; *fr o-r* to *r*; 4); Rubus biflorus (*fl w*; 5); R. deliciosus (*fl p*; 3); R. spectabilis (*fl r*; *fr r*; 6-10); Salix phylicifolia (10); Sambucus racemosa (*fl w*; *fr r*); Spartium junceum (*fl y*, *sc*; 6-10); Spiræa Douglasii (*fl pi*; 3); S. Lindleyana (*fl w*; 4-8); S. prunifolia flore-pleno (*fl w*; 3); Staphylea colchica (*fl w*; 3-5); S. pinnata (*fl w*; 6-12); Stuartia pentagyna (*fl c*; 10); S. virginica (*fl w*; 8); Styrax grandifolia (*fl w*; 6); Symphoricarpus occidentalis (*fl w*, tinged *pi*); Syringa Emodi (*fl p* or *w*; 6); S. Josikæa (*fl b-p*; 5-10); S. vulgaris (*fl r*, *b*, or *w*; 8-20); S. v. alba (*fl w*; 12-15); Tamarix gallica (*fl w* or *pi*, 5-10); T. parviflora (*fl pi*); Vaccinium corymbosum (*fl w* or *pi*; *fr b-bk*; 5-10); V. formosum (*fl r-pi*; *fr b*; 2-3); V. pennsylvanicum (*fl w* or *pi*; *fr b-bk*, *gl*; ¾-1); V. stamineum (*fl p* or *y-g*; *fr g* or *y*; 2-3); Viburnum dentatum (*fl w*; *fr b* or *p*; 5-10); V. dilatatum (*fl w*; 10); V. macrocephalum (*fl w*; 20); V. Opulus (*fl w* or *c-w*; *fr r*; 6-8); V. O. sterilis (*fl w*); V. plicatum (*fl w*; 4-6); V. prunifolium (*fl w*; 6); Zenobia speciosa (*fl w*; 2-4).

Half-hardy.—Ascyrum Crux-Andreæ (*fl y*; 1); Clematis Viorna coccinea (*fl r* and *y*; 5-6); Coronilla minima* (*fl y*, *sc*); Gaylussacia frondosa (*fl g-p*; *fr b*; 3-6); G. resinosa (*fl r*; *fr bk*, rarely *w*; 1-3); Hydrangea quercifolia (*fl w*; 4-6); H. Thunbergii (*fl b* or *pi*; 2-3); Ononis arragonensis (*fl y*; 1-2); Piper Futokadsura (*fl g*; *fr r*); Vaccinium Mortinia (*fl pi*; 2-3); Viburnum odoratissimum (*fl w*, *sc*; 6-10); Vitex Agnus-castus (*fl l*; 6).

Tender.—Abelia rupestris (*c-h*, *fl r-pi*, *sc*; 5); Barnadesia rosea (*c-h*, *fl pi*; 1½); Capparis spinosa (*c-h*, *fl w*); tinged *r*; 3); Chænostoma linifolia* (*c-h*, *fl w* and *y*; 1); Clerodendron Bethuneanum (*st*, *fl r*, spotted *w* and *p*; 10); C. fallax (*st*, *fl r*); C. fœtidum (*c-h*, *fl*, *l-pi*; 5); C. fragrans (*c-h*, *fl w*; 6); C. f. flore-pleno (*c-h*, *fl w*, suffused *pi*, *sc*; 6); C. squamatum (*st*, *fl r*; 10); Fuchsia corymbiflora (*c-h*, *fl r*; 4-6); F. dependens (*c-h*, *fl r*; 2-4); F. simplicicaulis (*c-h*, *fl pi-r*); F. splendens (*c-h*, *fl r* and *g*; 6); Gordonia anomala (*c-h*, *fl c*; 3); Moltkia petræa* (*c-h*, *fl pi-p*, becoming *v-b*; ½-¾); Pachypodium succulentum (*c-h*, *fl r* and *w*; 1); Solandra (Dissochroma) viridiflora (*st*, *fl g*; 2-3).

EVERGREEN.—Hardy.—Adenostoma fasciculata (*fl w*; 2); Ammodendron Sieversii (*fl p*; 2); Anthyllis erinacea (*fl b-p*; ½-1); Arbutus Unedo (*fl w*; *fr r*; 8-10); Artemisia argentea (*fl y*; 1½); A. cærulescens (*fl b*; 2); Astragalus Tragacantha (*fl v*; 1½-3); Aucuba himalaica (*fr*); A. japonica (*fol* spotted *y*; 6-10); Azalea ledifolia (*fl w*; 2-6); Azara microphylla (*fl g*; *fr o*; 12); Bambusa Fortunei (*fol g*; 1-2); Benthamia fragifera (*fl w*; 10-15); Berberis Darwinii (*fl o*; 2); Boleum asperum (*fl c*; ½-1); Bupleurum frutescens (*fl y*; 1); B. fruticosum (*fl y*; *fol g*; 3-6); Buxus sempervirens vars.; Calluna vulgaris vars.; Cassandra angustifolia (*fl w*; 1-2); C. calyculata (*fl w*; 1-3); Cassiope tetragona (*fl w*; ½-¾); Ceanothus dentatus (*fl b*; 4-6); C. floribundus (*fl b*; 4); C. Veitchianus (*fl b*; 3); Cerasus Laurocerasus (*fl w*; 6-10) and vars.; C. lusitanica (*fl w*; 10-20); Chamæcyparis obtusa nana; C. o. plumosa (15-20); C. o. p. albo-picta (branchlets *w*); C. o. p. argentea (*fol c-w*, turning *g*); C. o. p. aurea (*fol y*, turning *g*); C. squarrosa (*fol gl-g* above,

Evergreen (Hardy)—*continued.*

gl-banded beneath; 4-6); Chimaphila corymbosa* (*fl g-w*, tinged *r*; ¼-½); C. maculata (*fl w*; *fol* banded *w* above, *r* beneath); Cineraria maritima (*fl y*; *fol si*-downy; 2); Convolvulus Cneorum (*fl pi*; *fol si*-tomentose; 1-3); Coriaria myrtifolia (*fl g*; 4-6); Cotoneaster buxifolia (*fl w*; 3-4); C. microphylla (*fl w*; 3-4); C. thymifolia (*fl pi*; *fol si-w* beneath; 1); Cratægus Pyracantha (*fl w*; *fr r*; 10-20); Cupressus Goveniana (*fl y*; 15-20); C. MacNabiana (*fol*; 10-15); Daphne pontica (*fl g-y*, *sc*; 4-5); Dendromecon rigida (*fl y*); Dorycnium suffruticosum (*fl w* and *r*; 2-3); Elæagnus longipes (*fr o*; *fol si-w* beneath; 3); E. macrophylla (*fl g-y*; *fol si*-scaly; 6); E. pungens (*fl y*; *fol si* beneath; 6); Empetrum nigrum (*fl pi*; anthers *r*; ½-1) and var.; Erica carnea (*fl* pale *r*; ¼); E. ciliaris (*fl r*; 1); E. scoparia (*fl g*; 2-3); E. vagans (*fl p-r*; 1); Fabiana imbricata (*fl w*; 3); Frankenia pulverulenta (*fl r*; ¼); Garrya elliptica (*fl g-w* or *y*; 8-10); Gaultheria procumbens (*fl w*; *fr r*); G. Shallon (*fl w*, tinged *r*; *fr p*, ?); Iberis correæfolia (*fl w*; 1); I. saxatilis (*fl w*; ¼-½); I. sempervirens (*fl w*; ¾-1); I. s. Garrexiana (*fl w*; ½-¾); Ilex Aquifolium vars. (*fol* variegated); I. cornuta; I. crenata; I. dipyrena (12); I. latifolia (20); I. opaca (20-40); Indigofera Gerardiana (*fl r*; *fol gy-g*, *gl* below); Juniperus chinensis vars.; J. communis vars.; J. occidentalis (*fol gl* when young; 10-50); J. phœnicea (*fol*; 15-18); Kalmia angustifolia (*fl p* or *r*; 2-3); K. glauca (*fl l-p*; *fol gl-w* beneath; 1-2); K. latifolia (*fl pi* to *w*; 3-10); Lavandula vera (*fl b*, rarely *w*; 1-2); Ledum latifolium (*fl w*; *fol br*-tomentose beneath; 1-3); L. palustre (*fl w*; *fol br*-tomentose beneath; 2); Leiophyllum buxifolium (*fl w* and *pi*; ½-1); Leucothoë axillaris (*fl w*; 2-3); L. Davisiæ (*fl w*; 3-5); L. racemosa (*fl w*; 4-10); Ligustrum japonicum (*fl w*, *sc*; 6-8); L. lucidum (*fl w*; 8-12); L. Massalongianum (*fl w*, *sc*; 6); L. ovalifolium (*fl w*) and var.; Linum tauricum (*fl w*; 1½); Lonicera fragrantissima (*fl w*, *sc*; 6); Lupinus arboreus (*fl y*, *sc*); Magnolia glauca (*fl w*, *sc*; *fol gl* below; 15); Margyricarpus setosus (*fr w*; 2-4); Olearia Haastii (*fl w*; *fol w* beneath); Osmanthus Aquifolium (*fl w*, *sc*; 6); O. fragrans (*fl y* or *w*; 6-10); Pernettya furens (*fl w*; 3); P. mucronata (*fl w*; 6); P. pilosa (*fl w*; ½); Phillyrea Vilmoriniana (*fl w*); Phlomis fruticosa (*fl y*; 2-4); Pieris floribunda (*fl w*; 2-6); P. japonica (*fl w*); Quercus Ilex and vars.; Rhododendron Anthopogon (*fl g-y*; 1-1½); R. caucasicum (*fl pi*, and *w* spotted *g*; 1); R. ciliatum (*fl r-p*; 2); R. Clivianum (*fl w*, tinged *pi*, and dotted *p-r*; 4); R. ferrugineum (*fl r*, dotted *gy* or *y*; *fol br*-dotted beneath; 1); R. Fortunei (*fl pi*, *sc*; *fol gl* below; 12); R. hirsutum (*fl r*; *fol br*-dotted beneath; 1-2); R. Metternichii (*fl pi*); Rhodothamnus Chamæcistus (*fl pi*; ½); Rhodotypos kerrioides (*fl w*; 15); Rosmarinus officinalis (*fl w* or *b-p*; 2-4); Salvia ringens (*fl r-p*; 1-2); Skimmia japonica (*fl w*, *sc*; *fr r*; 3-4); S. Laureola (*fl y*, *sc*; *fol y* beneath; 4); S. oblata (*fr r*); S. rubella (*fl g-w*; buds tinged *r*); Spiræa cantoniensis (*fl w*; 3-4); Taxus baccata adpressa (*fol gl* beneath; 6-8); T. cuspidata (*fol y-g* beneath; 15-20); Thuya occidentalis Elwangeriana (*fol*); T. orientalis (*fol*; 18-20); Veronica pinguifolia (*fl w*; ¼-4); V. Traversii (*fl w*; 2½); Viburnum Tinus (*fl w*; *fr b*; 8-10); V. T. lucidum (*fl w*).

Half-hardy.—Adenocarpus foliolosus (*fl y*; 4-6); A. frankenioides (*fl y*; 1-3); Arctostaphylos nitida (*fl w*; 1-4); A. pungens (*fl w*; 1); Azara Gillesii (*fl y*; 15); A. integrifolia (*fl y*, *sc*; 18); Buddleia globosa (*fl o*; 15-20); Buxus balearica (*fol y-g*; 15-20); Cassia corymbosa (*fl y*; 6-10); Ceanothus cuneatus (*fl b* or *w*; 4); C. integerrimus (*fl w*; 3-6); C. rigidus (*fl p-b*; 5-6); Cedronella triphylla (*fl w* or *p*; *fol sc* when rubbed; 3-4); Ceratiola ericoides (*fl br*); Chamæbatia foliolosa (*fl w*; 2-3); Cheiranthus mutabilis (*fl c*, turning *p*, or striped; 2-3); Cistus albidus (*fl p* and *y*; 2); C. crispus (*fl r-p*; 2); C. heterophyllus (*fl r* and *y*; 2); C. hirsutus (*fl w*, marked *y*; 2); C. ladaniferus (*fl w*; 4); C. l. maculatus (*fl w*, spotted *r*); C. latifolius (*fl w*, spotted *y*; 3); C. laxus (*fl w*, spotted *y*; 3);

Evergreen (Half-hardy)—*continued.*

C. longifolius (*fl w*, marked *y*); C. monspeliensis (*fl w*; 4), C. m. florentinus (*fl w*, *y* at base; 3); C. oblongifolius (*fl w*, spotted *y*; 4); C. obtusifolius (*fl w*, spotted *y*; 1-1½); C. psilosepalus (*fl w*, marked *y*; 2-3); C. purpureus (*fl r-p*; 2); C. rotundifolius (*fl p*, marked *y*; 1); C. salvifolius Corbariensis (*fl w*; 2); C. vaginatus (*fl pi*; 2); C. villosus (*fl r-p*; 3); C. v. canescens (*fl p*, marked *b* and *y*; 2); Cordyline australis (*fl w*, *sc*; 10-40) and var.; Corokia Cotoneaster (*fl y*, *sc*); Coronilla glauca (*fl y*, *sc*; 2-4); Embothrium coccineum (*fl o-r*; 3); Escallonia floribunda (*fl w*; 10); E. macrantha (*fl r*; 3-6); E. organensis (*fl pi*; *fol* margined *r*; 2-4); E. rubra (*fl r*; 3-6); Euonymus fimbriatus (*fl w*; 12); E. japonicus (*fl w*; 20); Eurya japonica latifolia variegata (*fl w*; *fol* variegated *y*); Fatsia japonica and vars.; F. papyrifera (*fl g*; 6-8); Geranium anemonæfolium (*fl p-r*; 1-2); Grindelia glutinosa (*fl y*; 2); Hudsonia ericoides (*fl y*; 1); Hypericum empetrifolium (*fl y*; ½-1); H. Hookerianum (*fl y*; 2); Iberis gibraltarica (*fl w*, suffused *pi* or *r*; 1-2); I. semperflorens (*fl w*, *sc*; 1-2); Illicium anisatum (*fl y-w*, *sc*; 4); I. floridanum (*fl r*, *sc*; 8); Indigofera decora alba (*fl w*); Linum arboreum (*fl y*; 1); L. flavum* (*fl y*; 1-1½); Lupinus mutabilis* (*fl w* and *b*, changing to *b* and *y*; 5); Mathiola bicornis* (*fl p-r*); Myrtus communis (*fl w*; 3-10) and vars.; Olearia dentata (*fl pi-w*; 3); O. Gunniana (*fl w*; 3-5); Phillyrea media (*fl w*; 10-15); Photinia japonica (*fl w*; *fr o-r*; 10-20); P. serrulata (*fl w*; 10-20); Pieris formosa (*fl w*); Piptanthus nepalensis (*fl y*; 10); Pittosporum crassifolium (*fl br-p*; 4-10); P. Tobira (*fl w*, *sc*; 12); P. undulatum (*fl w*; 10); Plagianthus Lampenii (*fl y-w*; 6-8); Reaumuria hypericoides (*fl p*; 2); Rhododendron campanulatum (*fl l* spotted *p*, or *pi*; *fol gy*-powdery below; 4); R. cinnabarnum (*fl br-r*); R. glaucum (*fl pi-p*; *fol* beneath *gl*, nearly *w*; 2); R. lepidotum (*fl y* or *p*, dotted *g*; anthers *r-br*; 2-4); R. Maddeni (*fl w*, tinged *w-pi*; 6-8); R. Veitchianum (*fl w*; *fol gl* and *r* or *br* scaly beneath; 6); Stachyurus præcox (*fl y-g*; 10); Sutherlandia frutescens (*fl r*; 3); Veronica Andersonii (*fl b-v*; 1½); V. elliptica (*fl w*; 5-10); V. Hulkeana (*fl l*; 1-3); Zauschneria californica (*fl r*; 1).

Tender.—Abelia floribunda (*c-h*, *fl pi-p*; 3); A. triflora (*c-h*, *fl y*, tinged *pi*; 5); Abutilon insigne (*c-h*, *fl p-r*; 6); A. striatum (*c-h*, *fl o-y*, striped *r*; 10); A. vittifolium (*c-h*, *fl b*; 30); A. varieties (*c-h*); Acacia affinis (*c-h*, *fl y*; 5); A. albicans (*c-h*, *fl w*; 5); A. armata (*c-h*, *fl y*; 6-10); A. brachybotrya (*c-h*, *fl y*; 8); A. cultriformis (*c-h*, *fl y*; 4); A. cuneata (*c-h*, *fl y*; 6); A. dealbata (*i-h*, *fl y*; 10-20); A. Drummondi (*c-h*, *fl y*; 10); A. glauca (*c-h*, *fl w*; 5-10); A. grandis (*c-h*, *fl y*; 6); A. heterophylla (*c-h*, *fl y*; 5); A. hispidissima (*c-h*, *fl w*; 3-6); A. linearis (*c-h*, *fl y*; 3-6); A. longifolia (*c-h*, *fl y*; 10); A. lunata (*c-h*, *fl y*; 2-4); A. mollissima (*c-h*, *fl y*; *fol y*-downy; 10-20); A. oxycedrus (*c-h*, *fl y*; 6-10); A. platyptera (*c-h*, *fl y*; 3); A. pubescens (*c-h*, *fl y*; 6-10); A. puichella (*c-h*, *fl y*; 2-3); A. Riceana (*c-h*, *fl y*; 20); A. sphærocephala (*st*, *fl y*); A. verticillata (*c-h*, *fl y*; 6-10); A. vestita (*c-h*, *fl y*; 4); A. viscidula (*c-h*, *fl y*; 6); Aciotis discolor (*i-h*, *fl r*; *fol p* beneath; 1); Acmadena tetragona (*c-h*, *fl w*; 1-2); Acmena floribunda (*c-h*, *fl w*; *fr p*; *fol* dotted; 4); A. ovata (*c-h*, *fol p*); Acradenia Frankliniæ (*c-h*, *fl w*; *fol sc*; 8); Acridocarpus natalitius (*i-h*, *fl y*); Acronychia Cunninghami (*c-h*, *fl w*, *sc*; 7); Acrophyllum venosum (*c-h*, *fl pi-w*; 6); Acrotriche cordata (*c-h*, *fl w*; 1); A. divaricata (*c-h*, *fl w*; ½-1); Adenandra amœna (*c-h*, *fl w* and *r*; 1-2); A. fragrans (*c-h*, *fl pi*, *sc*; 1-2); A. marginata (*c-h*, *fl pi*; 1-2); A. umbellata (*c-h*, *fl pi*; 1-2); A. u. speciosa (*c-h*, *fl pi*; 1-2); A. uniflora (*c-h*, *fl w*, *pi* outside; 1-2); A. villosa (*c-h*, *fl pi*; 1-2); Adenanthos barbigera (*c-h*, *fl r*; 7); A. obovata (*c-h*, *fl r*; 5); Adesmia glutinosa (*c-h*, *fl y*; 1-2); A. microphylla (*c-h*, *fl y*; 1-2); Adina globiflora (*i-h*, *fl y*; 3-4); Ægiphila grandiflora (*st*, *fl y*; *fr b*; 3); Æschynanthus atrosanguinea (*st*, *fl r*, *sc*; 1½); Æ. Boschianus (*st*, *fl r*, *sc*; 1); Æ. cordifolius (*st*, *fl r*, *bk*, and *o*, *sc*; 1); Æ. fulgens (*st*, *fl r* and *o*, *sc*;

Evergreen (Tender)—*continued.*

1); Æ. grandiflorus (*st, fl r* and *o, sc*; 5); Æ. longiflorus (*st, fl r, sc*); Æ. miniatus (*st, fl r, sc*; 1½); Æ. speciosus (*st, fl o, sc*; 2); Æ. splendidus (*st, fl r* and *bk, sc*; 1); Æ. tricolor (*st, fl r, o,* and *bk, sc*; 1); Æschynomene sensitiva (*st, fl w*; 3-6); Agapetes buxifolia (*st, fl r*; 5); Agastachys odorata (*c-h, fl y, sc*; 3); Agathosma acuminata (*c-h, fl v*; 1-2); A. bruniades (*c-h, fl l* or *w*; 1-2); A. ciliata (*c-h, fl w*; 1-2); A. erecta (*c-h, fl v*; 1-2); Allamanda neriifolia (*st, fl y,* streaked *o*; 3); Alloplectus peltatus (*st, fl w*; 1); A. zamorensis (*st, fl y* and *o-r*; 1); Alona cœlestis (*c-h, fl b*; 2); Alonsoa albiflora (*c-h, fl w* and *y*; 1½-2); A. incisifolia (*c-h, fl r*; 1-2); Alsodeia latifolia (*st, fl w*; 6); Andersonia sprengelioides (*c-h, fl pi*; 1-3); Angophora cordifolia (*c-h, fl y*; 7-10); A. lanceolata (*c-h, fl w*; 4-6); Anisomeles furcata (*c-h, fl w, r,* and *p*; 4-6); Anona glabra (*st, fl b; fol sc*; 16); A. muricata (*st, fl g* and *y, sc*; *fol sc*; 15); Anopterus glandulosa (*c-h, fl w,* tinted *pi*; 3); Anthocercis albicans (*c-h, fl w,* marked *b-p, sc*; 1½-2); A. viscosa (*c-h, fl w*; 4-6); Anthospermum æthiopicum (*c-h, fl b, g*; 2-3); Anthyllis Barba-Jovis (*c-h, fl y*; 4-8); Aotus gracillima (*c-h, fl y* and *pi*; 3); Aphelandra aurantiaca (*st, fl o-r*; 3); A. a. Roezlii (*st, fl r*; *fol* dark *g,* shaded *si*); A. cristata (*st, fl o-r*; 3); A. fascinator (*st, fl r*; *fol* banded *si-w*; 1½); A. Leopoldi (*st, fl g-y*; *fol g* and *w*); A. nitens (*st, fl r*; *fol g* and *p*; 2-3); A. Porteana (*st, fl o*; *fol g* and *si-w*; 2); A. pumila (*st, fl o*; ¾); A. punctata (*st, fl y*; *fol* marked *w*); A. variegata (*st, y*; 1½); Aphelexis ericoides (*c-h, fl w*; 1); A. humilis (*c-h, fl pi*; 2) and vars.; Ardisia crenulata (*st, fl r-v*; *fr r*; 3-6); A. japonica (*c-h, fl w*; 1); A. macrocarpa (*c-h, fl w-pi*; *fr r*; 5-6); A. paniculata (*st, fl pi*; *fr r*; 8-10); A. serrulata (*st, fl r*; 2-3); Aristolochia ciliosa (*st, fl p-y*; 6); A. Duchartrei (*st, fl br* and *c*; 5); A. floribunda (*st, fl p-r* and *y*; 10); A. labiosa (*st, fl g*; 20); A. ornithocephala (*st, fl p, gy,* and *b*; 20); A. ringens (*st, fl g,* marked *bk-p*; 20); A. tricaudata (*st, fl p-br*); Artabotrys odoratissimus (*st, fl r-br, sc*; 6); Astelma eximium (*c-h, fl r*; 3); Asystasia chelonioides* (*st, fl r-p* and *w*; 3-4); A. macrophylla (*st, fl pi-p* and *w*; 8-20); A. violacea (*st, fl v-p,* striped *w*; 1-2); Athanasia capitata (*c-h, fl y*; 1½); Athrixia capensis (*c-h, fl r*; 3); Azalea indica (*c-h, fl r,* 3-6) and vars; Babingtonia Camphorasme (*c-h, fl pi-w*; 7); Backhousia myrtifolia (*c-h, fl w*; 16); Bæckea diosmæfolia (*c-h, fl w*; 1-2); B. frutescens (*c-h, fl w*; 2-3); B. virgata (*c-h, fl w*; 2-3); Bambusa arundinacea (*st, fol* light *g*; 50-60); B. aurea (*c-h, fol* turning *y*; 6-10); B. nana (*i-h, fol gl*; 6-8); Banksia collina (*c-h, fol si* beneath; 6-8); B. dryandroides (*c-h, fol r-br* beneath; 6); B. occidentalis (*c-h, fl y*); B. Solanderi (*c-h, fol si-w* beneath; 6); B. speciosa (*c-h, fol si-w* beneath; 6); Barbieria polyphylla (*st, fl r*); Barleria flava (*st, fl y*; 3); Barosma dioica (*c-h, fl p*; 1-2); B. pulchella (*c-h, fl r* or *p*; 1-3); B. serratifolia (*c-h, fl w*; 1-3); Bauera rubioides (*c-h, fl r* or *pi*); Bauhinia natalensis (*st, fl w*); B. variegata (*st, fl r, w,* and *y*; 20); Befaria æstuans (*c-h, fl p*; *fol gl* beneath; 10-15); B. glauca (*c-h, fl pi-w*; *fol gl* beneath; 3-6); B. ledifolia (*c-h, fl p*; 3-4); Begonia coccinea (*st, fl* and peduncles *r*; 1-2); B. crinita (*st, fl pi*; *fol* edged dark *g*; 1); B. dædalea (*st, fl pi* and *w*; *fol g,* marked *br, r* when young; 2); B. Kunthiana (*st, fl w*; *fol* dark *g* above, *r* below; 2); B. Lindleyana (*st, fl w*; 3); B. longipes (*st, fl w*; 3); B. Lynchiana (*st, fl r*); B. maculata (*st, fl r*; *fol g,* blotched *si-w* above, *r* below); B. magnifica (*st, fl pi*); B. Manni (*st, fl pi-r*; 2); B. nitida (*st, fl pi*; *fol* glossy *g*; 4-5); B. opuliflora (*st, fl w*; 2); B. platanifolia (*st, fl w,* tinted *pi*; *fol* dark *g*; 5-6); B. prestoniensis (*st, fl o-r, sc*; 2); B. ramentacea (*st, fl pi* and *w*; *fol r* beneath; 1); Berkheya grandiflora (*c-h, fl y*; 2); Bertolonia marmorata (*st, fol* bright *g,* streaked *w* above, *p* below; ½); B. pubescens (*st, fol* light *g* and *br*; ½); Berzelia lanuginosa (*c-h, fl w*; 1-2); Besleria grandiflora* (*st, fl* spotted *r*; 3); Bignonia speciosa (*st, fl pi,* marked *p*; 4); Blæria articulata (*c-h, fl r*; 1); Bocconia frutescens (*st, fl g*; 3-6); Bœbera incana (*c-h, fl y*; 1½); Borbonia barbata (*c-h, fl y*; 3-4); B. crenata (*c-h, fl y*; 3-6); Boronia

Evergreen (Tender)—*continued.*

crenulata (*c-h, fl r*; 1-4); B. Drummondi (*c-h, fl pi*; 2); B. elatior (*c-h, fl pi, sc*; 4); B. megastigma (*c-h, fl br-p* and *y, sc*; 1); B. pinnata (*c-h, fl pi, sc*; 1-3); B. serrulata (*c-h, fl pi, sc*; 1-6); Bossiæa disticha (*c-h, fl y-r*; 1½); B. linnæoides (*c-h, fl y* and *br*); B. linophylla (*c-h, fl o* and *p*; 1-4); B. rhombifolia (*c-h, fl y, r,* and *br-p*; 1-3); Bouvardia angustifolia (*i-h, fl r*; 2); B. flava (*i-h, fl y*; 1½); B. Humboldtii corymbiflora (*i-h, fl w, sc*); B. jasminiflora (*i-h, fl w, sc*); B. leiantha (*i-h, fl r*; 2); B. longiflora (*i-h, fl w*; 2-3); B. triphylla (*i-h, fl r*; 2-3); Brachychiton Bidwillii (*c-h, fl r*); Brachylæna nerifolia (*c-h, fl y*; 2); Brillantaisia owariensis (*st, fl v-b*; 3); Brongniartia podalyrioides (*c-h, fl p*; 1); B. sericea (*c-h, fl p*; 1); Browallia Jamesoni (*c-h, fl o*; 4); Brownea coccinea (*st, fl r*; 6-10); B. racemosa (*st, fl pi*; 4); Brucea sumatrana (*st, fl p*; 20); Brunfelsia acuminata (*st, fl b-v*; 1-2); B. americana (*st, fl y,* changing to *w, sc*; 4-6); B. calycina (*st, fl p*; 2); B. eximia (*st, fl p*; 2½); B. hydrangeæformis (*st, fl b-v*; 1-3); B. Lindeniana (*st, fl p*); Brunia nodiflora (*c-h, fl w*; 1-3); Buddleia asiatica (*st, fl w, sc*; 3); Bunchosia argentea (*c-h, fl y*; *fol si* beneath; 10); B. odorata (*c-h, fl y, sc*; 7); Burchellia capensis (*st, fl r*; 3-5); Bursaria spinosa (*c-h, fl w*; 10); Burtonia conferta (*c-h, fl v*; 2); B. scabra (*c-h, fl p*; 2); Butea superba (*st, fl r*); Byrsonima chrysophylla (*st, fl y*; *fol r-y* downy beneath; 14); B. lucida (*st, fl pi*; 8); Cajanus indicus (*st, fl y* or spotted *p*; 6-10); Calceolaria bicolor* (*c-h, fl y* and *w*; 2-3); C. fuchsiæfolia (*c-h, fl y*; 1-2); C. hyssopifolia (*c-h, fl y* and *w*; 1-2); C. violacea (*c-h, fl v*; 2); Calliandra Tweediei (*st, fl r*; 6); Callistemon linearis (*c-h, fl r*; 4-6); C. speciosus (*c-h, fl r*; *fol,* when young, *r*; 5-10); Calotropis gigantea (*st, fl pi* and *p*; 6-15); Calycophyllum candidissimum (*st, fl w*; 30); Calythrix tetragona (*c-h, fl w*; 2); Camellia japonica (*c-h, fl* various; 20) and vars.; C. oleifera (*c-h, fl w, sc*; 6-8); Camoensia maxima (*st, fl c* and *y*); Candollea cuneiformis (*c-h, fl y*; 7); Cantua buxifolia (*c-h, fl r*; 4); C. pyrifolia (*c-h, fl y-w*; 3); Capparis amygdalina (*st, fl w*; *fol* under surface, and branches, dotted *si*; 6); C. odoratissima (*st, fl v, sc,* anthers *y*; 6); Careya arborea (*st, fl w,* stamens *r*; 30-60); Carludovica atrovirens (*st, fol* deep *g*); C. Drudei (*st, fl w*; *fol* deep *g*; 4); C. palmata (*st, fol* dark *g*; 4-6); C. Wallisii (*st, fl w, sc*); Carmichælia australis (*c-h, fl l*; 2-4); Cassia alata (*st, fl y*; 6); C. tomentosa (*st, fl y*; 5-7); Cassinia denticulata (*c-h, fl y*; 6-8); Ceanothus azureus (*c-h, fl b*; 10); Celastrus lucidus (*c-h, fl w*; 1-3); Centradenia rosea (*st, fl pi*; 1); Cephaelis tomentosa (*st, fl br*; bracts *r*; 4); Ceratostema speciosum (*c-h, fl o-r*); Cercocarpus fothergilloides (*c-h, fl p*; 12); Cestrum aurantiacum (*c-h, fl o*; 4); C. fasciculatum (*c-h, fl p-r*; 5); C. Newelli (*c-h, fl r*; 6); C. roseum (*c-h, fl pi*; 4); Chætogastra strigosa (*c-h, fl pi-p*; 1); Chiococca racemosa (*st, fl w,* unscented, becoming *y* and *sc*; 4-6); Chirita Moonii* (*st, fl p*; 2); Chloanthes stœchadis (*c-h, fl g-y*; 2); Chomelia spinosa (*st, fl w, sc* at night; 8-12); Chorizema angustifolium* (*c-h, fl o-r*; 1½); C. cordatum* (*c-h, fl r* or *y*; 3); C. diversifolium* (*c-h, fl o-r*; 2); C. Henchmannii* (*c-h, fl r*; 2); C. varium* (*c-h, fl y* and *r*; 4); Citrus medica (*i-h, fl w, sc*; *fr y, sc*; 8-16); C. nobilis (*i-h, fl w, sc*; *fr r*; 15); Cleome gigantea (*st, fl w-g,* filaments *pi,* anthers *y*; 6-12); Clerodendron fallax (*st, fl r*); C. Thomsonæ (*st, fl r* and *w*); Cneorum pulverulentum (*c-h, fl y*; 1-3); Codiæum albicans (*st, fol g,* variegated *w,* tinted *r* beneath); C. angustissimum (*st. fol g,* marked *y*); C. aucubæfolium (*st, fol g,* blotched *y* or *r*); C. Baron Franck Seillière (*st, fol g,* when adult *pi* beneath; nerves *y,* turning *w*); C. chelsoni (*st, fol* variegated *pi-o,* shaded *r*); C. Crown Prince (*st, fol* marked *y*); C. Disraeli (*st, fol* marked *y*); C. Dodgsonæ (*st, fol* marked *y*); C. Earl of Derby (*st, fol* suffused *r*; stems, petioles, and mid-rib *y*); C. elegans (*st, fol* marked *r* or *y* and *pi* above, mottled *p* below); C. Evansianum (*st, fol g,* veined and dotted *y,* changing to bronzy-*r,* veined and dotted *o-r*); C. gloriosum (*st, fol* variegated *c-y*); C. Goldiei (*st, fol* marked *y*);

Evergreen (Tender)—*continued.*

C. Hawkeri (*st, fol c-y,* margined *g*); C. Hilleanum (*st, fol* above *p-g* veined *r*, below *p* veined *r*); C. Hookerianum (*st, fol* blotched and veined *y*); C. imperator (*st, fol* marked *c-w*); C. insigne (*st, fol* marked *y* and *r*); C. irregulare (*st, fol* marked *y*); C. Jamesii (*st, fol* sage-*g*, marked *c-w*, *g*, and *y*); C. Johannis (*st, fol* marked *o-y*); C. majesticum (*st, fol*, when young, *g*, ribbed *y*, becoming deep olive, ribbed *r*); C. medium variegatum (*st, fol* marked *y*); C. Mrs. Dorman (*st, fol* striped *o-r*); C. Nevilliæ (*st, fol* olive-*g*, marked *y* when young; when older, metallic-*g*, marked *r*, shaded *o*); C. Pilgrimii (*st, fol* marked *y*, suffused *pi*); C. princeps (*st, fol g*, marked *y*, becoming bronzy-*g*, marked *pi-r*); C. Queen Victoria (*st, fol y*, mottled *g* and margined *pi*; veins *m*, changing to *r*); C. spirale (*st, fol* when young, *g*, marked *y*; when mature, bronzy-*g* with *r* midrib); C. superbiens (*st, fol* at first *g* marked *y*, finally *b*-bronze, *r-br*, and *r*); C. tricolor (*st, fol*, upper surface *g* and *y*, lower surface *r-g*); C. triumphans (*st, fol g*, marked *y*, becoming *g*-bronze; midrib *r*); C. undulatum (*st, fol p* blotched *r*; midrib *p*); C. Veitchii (*st, fol* above *g*, margined and veined *pi*, beneath *p*); C. volutum *st, fol* veined *y*; C. Warrenii (*st, fol* mottled and suffused *o-y* and *pi*, which changes to *r*); C. Weismanni (*st, fol* marked *y*); C. Williamsii (*st, fol*, upper surface banded *y*; midrib and primary veins *m*, changing to *v-r*; under surface *r*); C. Youngii (*st, fol*, upper surface marked *y* and *pi-r*; under surface *r*); Coffea arabica (*st, fl w, sc*; 5-15); Colea floribunda (*st, fl y-w*; 10); Colquhounia tomentosa (*c-h, fl o-r*); Columnea aurantiaca (*st, fl o* and *y-g*); C. aureonitens, *st, fl o-r*); C. erythrophæa (*st, fl r*; 2); C. Kalbreyeriana (*st, fl y*, marked *r*; *fol r* beneath); Comarostaphylis arbutoides (*c-h, fl w*; 6); Conocarpus erectus (*st, fl w*); Coprosma Baueriana picturata (*c-h, fol* blotched *y* and *c-w*); C. B. variegata (*c-h, fol* margined *w*); Cordia decandra (*c-h, fl w, sc*; 3); Cordyline albicans (*st, fol* bordered *w*); C. albo-rosea (*st, fol* edged *pi*, when young *w*); C. amabilis (*st, fol* marked *pi* and *c-w*); C. amboynensis (*st, fol*, lower half edged *r-pi*); C. Baptistii (*st, fol* margined and striped *y* and *pi*; stem variegated); C. cannæfolia (*st*); C. chelsoni (*st, fol bk-g*, marked *r*); C. Cooperii (*st, fol r*); C. Duffii (*st, fol* margined and barred *r*); C. excelsa (*st, fol* margined *r*); C. Fraseri (*st, fol bk-p* marked *pi-r*); C. gloriosa (*st, fol*, when mature, marked bronzy-*o*); C. Guilfoylei (*st, fol* striped *r, pi, y-w*, and *g*); C. indivisa and vars. (*c-h*); C. lutescens-striata (*st, fol y-g* beneath); C. Macarthurii (*st, fol pi* and olive-*g*); C. magnifica (*st, fol* bronzy-*pi*); C. metallica (*st, fol br-p*, becoming *p*-bronze); C. Mooreana (*st, fol* bronzy *p*; midrib *r*); C. nigro-rubra (*st, fol br* and *r-pi*); C. ornata (*st, fol* bronzy *g*, margined *pi*); C. pulchella (*st, fol* bronze, edged *r*); C. Rex (*st, fol* bronzy *g*, flushed *pi-p*, streaked *r-pi*); C. splendens (*st, fol* bronzy *g*; when young marked *pi*); C. terminalis (*st, fol* dark *g* and *r*); C. triumphans (*st, fol bk-p, gl* beneath; when young marked *pi*); C. Weismanni (*st, fol* when young *br-r*, tinged *c-w*, changing to bronze, margined *r*); C. Youngi (*st, fol* streaked *r* and tinged *pi*, changing to bronze); Correa cardinalis (*c-h, fl r* and *g*; 3); C. Harrisii (*c-h, fl r*); C. pulchella (*c-h, fl pi*; 6); Cossignia pinnata (*st, fl w*; *fol* veined *o-y* beneath; 10-20); Cowania mexicana (*c-h, fl y*; 1-6); C. plicata (*c-h, fl r*; 1-2); Crassula arborescens (*c-h, fl pi*; *fol gl*; 2-3); C. coccinea (*c-h, fl r*; 1-3); C. ericoides (*c-h, fl w*; ½); C. falcata (*c-h, fl r*, rarely *w*; 3-8); C. jasminea (*c-h, fl w*, becoming *r*); C. lactea (*c-h, fl w*; 1-2); C. versicolor (*c-h, fl r* and *w, sc*); Crossandra guineensis (*st, fl l*; *fol* nerved *y* above, *r* beneath); Crotalaria cajanifolia (*c-h, fl y*; 4-6); C. Cunninghamii (*c-h, fl y-g*, marked *p*; whole plant *gl*; 3); Crowea angustifolia (*c-h, fl r*; 1-3); C. saligna (*c-h, fl pi*; 1-2); Curatella americana (*st, fl w*; 10); Cyanophyllum magnificum (*st, fol* above velvety *g*, veined *w*, beneath *r-p*); Daphne odora (*c-h, fl p, sc*; 3) and var.; Darwinia fimbriata (*c-h, fl pi*; 1-2); C. macrostegia (*c-h, fl w, y*, and *r*; 2-3); Datura arborea

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(*c-h, fl w*; 7-10); D. meteloides (*c-h, fl b-v* or *w*); D. suaveolens (*c-h, fl w, sc*; 10-15); Dianthus arbusculus (*c-h, fl p-r*; 1½); Dillwynia ericifolia (*c-h, fl y*); D. hispida (*c-h, fl r*); Diosma ericoides (*c-h, fl w*, tinged *r*; 1-3); Dipladenia amabilis (*st, fl pi-r*; 10); D. amœna (*st, fl pi*); D. boliviensis (*st, fl w*); D. Brearleyana (*st, fl pi*, changing to *r*); D. diadema (*st, fl pi*); D. hybrida (*st, fl r*); D. insignis (*st, fl pi-p*); D. nobilis (*st, fl pi-p*, changing to *o-r*); D. Regina (*st, fl pi*, changing to *pi-w*); D. splendens profusa (*st, fl r*); Dombeya Burgessiæ (*st, fl w*, marked *pi*; 10); D. Mastersii (*st, fl w, sc*); Draccæna concinna (*st, fol* margined *p-r*; 6); D. Goldieana (*st, fl w*; *fol* banded dark *g* and *si-gy*); D. Lindeni (*st, fol* banded *c-w* and *y*); D. phrynioides (*st, fol* spotted *y*); D. surculosa maculata (*st, fl y*; *fol* spotted *y*); Dracophyllum capitatum (*c-h, fl w*; *fol* tipped *r*; 1-1½); D. gracile (*c-h, fl w, sc*); Dryandra armata (*c-h, fl y*; 2-4); D. nivea (*c-h, fol w* beneath; 2-3); D. pteridifolia (*c-h, fl y*; 1½); Duranta Plumieri (*st, fl b*; 6-15); Echium fastuosum (*c-h, fl b*; 2-4); Elæocarpus grandiflora (*st, fl r, w*, and *y*; 7); Elæodendron capense (*c-h, fr y*; 18); Enkianthus quinqueflorus (*c-h, fl r* and *pi*; 3-10); Epacris impressa (*c-h, fl* varying from *w* to *r*; 2-3); E. longiflora (*c-h, fl r* and *w*; 2-4); E. pulchella (*c-h, fl r* or *pi*; 1-3); E. purpurascens (*c-h, fl w*, tinged *r*; 2-3); Ephedra nebrodensis (*c-h, fl w*; 3-4); E. vulgaris (*c-h, fl w*; 1-2); Eranthemum albo-marginatum (*st, fol* margined *w*, suffused *g*); E. aspersum (*st, fl w*, spotted *p*); E. atropurpureum (*st, fol* and stems dark *p*); E. cinnabarinum (*st, fl r-pi*); E. pulchellum (*st, fl b*; 2); E. reticulatum (*st, fol* netted *y*); E. tuberculatum (*st, fl w*); Erica Aitonia (*c-h, fl r* or nearly *w*; 2); E. ampullacea (*c-h, fl r*; 2); E. andromedæflora (*c-h, fl r* or *r-p*; 1-3); E. aristata Barnesii (*c-h, fl r* and *w*); E. Austiniana (*c-h, fl w*, marked *r*); E. Beaumontiana (*c-h, fl w*, tinged *p*; 1); E. Bergiana (*c-h, fl p*; 1½); E. Bowieana (*c-h, fl w*; *fol gl*; 1); E. caffra (*c-h, fl w, sc*; 1½); E. Candolleana (*c-h, fl r-pi* and *w*); E. Cavendishiana (*c-h, fl y*; 1½); E. cerinthoides (*c-h, fl r*; 3); E. Chamissonis (*c-h, fl pi*; 1½); E. colorans (*c-h, fl* varying from *r* to *w*; 2); E. echiiflora (*c-h, fl r*; 1½); E. elegans (*c-h, fl pi* and *g*; *fol gl*; ½-1); E. eximia (*c-h, fl r* and *g*; 2); E. Fairieana (*c-h, fl pi* and *w*); E. gracilis (*c-h, fl p-r*; 1); E. g. vernalis (*c-h, fl p-r*; 2-3); E. grandiflora (*c-h, fl y*; 3); E. hybrida (*c-h, fl r*); E. hyemalis (*c-h, fl pi* and *w*; 2); E. Irbyana (*c-h, fl w*, tinged *r*; 1-2); E. jasminiflora (*c-h, fl r*; 1-2); E. Lambertiana (*c-h, fl w*; 1-2); E. Linnæana (*c-h, fl w* and *r*; 1½); E. Marnockiana (*c-h, fl p*); E. Massonii (*c-h, fl r* and *g-y*; 3); E. McNabiana (*c-h, fl pi-r* and *w*); E. melanthera (*c-h, fl* tinged *pi*; anthers *bk*; 2); E. odorata (*c-h, fl w, sc*; 1); E. Parmentieriana (*c-h, fl r-p*; 1); E. perspicua nana (*c-h, fl w* and *pi-w*); E. physodes (*c-h, fl w*; 1-2); E. primuloides (*c-h, fl pi-p*; 1); E. propendens (*c-h, fl p* or *r*; 1); E. ramentacea (*c-h, fl p-r*; 1½); E. rubro-calyx (*c-h, fl w* and *r-p*); E. Savileana (*c-h, fl r* or *p-r*; 1); E. Shannoniana (*c-h, fl w*, tinged *p*; 1-2); E. tricolor (*c-h, fl r, w*, and *g-y*; 2) and vars.; E. ventricosa coccinea minor (*c-h, fl w* and *r*); E. v. grandiflora (*c-h, fl pi-p*); E. v. tricolor (*c-h, fl pi, r*, and *w*); E. vestita (*c-h, fl w*; 3) and vars.; E. Victoria (*c-h, fl p* and *w*); E. Westphalingia (*c-h, fl pi-r*); E. Wilmoreana (*c-h, fl pi*); Eriostemon buxifolius (*c-h, fl pi*; 1-2); E. intermedius (*c-h, fl w*, suffused *pi*; 3); E. myoporoides (*c-h, fl pi*; 1-2); E. neriifolius (*c-h, fl pi*; 3); E. scaber (*c-h, fl w*, tinged *pi*; 1½); Eupatorium atrorubens (*c-h, fl r*, shaded *l*); E. ianthinum (*c-h, fl p*; 3); E. riparium (*c-h, fl w*); E. Weinmannianum (*c-h, fl w, sc*); Eutaxia myrtifolia (*c-h, fl y*; 2-6); Fagræa auriculata (*st, fl y*); Faramea odoratissima (*st, fl w, sc*; 6); Ficus Brassii (*st*); F. Chauvieri (*c-h*); F. Cooperi (*st*); F. dealbata (*c-h, fol w* beneath); F. diversifolia (*c-h, fol* dotted *br* above); F. eburnea (*c-h, fol* veined *w*); F. elastica (*c-h, fol y-g* beneath); F. exsculpta (*st*); F. macrophylla (*c-h*); F. Parcelli (*st, fol* blotched *w*); Fittonia

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gigantea* (*st, fl r*; *fol* veined *r*; 1½); F. Verschaffeltii* (*st, fol* veined *r*); F. V. argyroneura (*st, fol* veined *w*); F. V. Pearcei (*st, fol* veined *r, gl* beneath); Fouquiera formosa (*st, fl r*; 6-10); Fuchsia apetala (*c-h, fl r* and *y*; 1-2); F. fulgens (*c-h, fl r*; 4-6); F. macrostema (*c-h, fl r*; 6-12) and vars; F. microphylla (*c-h, fl r*; 2); F. penduliflora (*st, fl r*); F. thymifolia (*c-h, fl r*; 4-6); F. triphylla (*st, fl r*; *fol p* beneath; 1-2); Galphimia glauca (*st, fl y*; 8); Gardenia florida (*st, fl w, sc*; 2-6); G. f. Fortunei (*st, fl w, sc*); G. nitida (*st, fl w*; 3); G. radicans major (*st, fl w, sc*); G. Thunbergia (*c-h, fl w, sc*; 4-5); Gastrolobium bilobum (*c-h, fl y*; 2); G. calycinum (*c-h, fl y*; 2); Gaultheria antipoda (*c-h, fl w* or *pi*; 6); G. ferruginea (*c-h, fl pi*); G. fragrantissima (*c-h, fl w* or *pi*); Gazania uniflora* (*c-h, fl y*; 1); Geissomeria coccinea (*st, fl r*; 3); Gnidia pinifolia (*c-h, fl c-w, sc*; 1); Godoya splendida (*st, fl w, sc*; 10); Goethea Makoyana (*st*, bracts *r*; 2); G. multiflora (*st*, bracts *pi* or *r*); Gomphia olivæformis (*st, fl y*; 10-15); Gomphocarpus fruticosus (*c-h, fl w*; 5-7); Gompholobium grandiflorum (*c-h, fl y*; 2); G. Knightianum (*c-h, fl pi* or *p*; 1); G. polymorphum (*c-h, fl r, y*, and *p*; 2); G. venustum (*c-h, fl p*; 1-3); Goodia lotifolia (*c-h, fl y* and *r*; 2-4); G. pubescens (*c-h, fl y*, spotted *r*; 1-3); Graptophyllum hortense (*st, fl r*; 2); Grevillea acanthifolia (*c-h, fl r*; 4); G. alpina (*c-h, fl r* and *y*; 4); G. Banksii (*c-h, fl r*; *fol w*; 15); G. fasciculata (*c-h, fl r* and *y*; 3-4); G. lavandulacea (*c-h, fl pi*; 5); G. macrostylis (*c-h, fl r* and *y*; *fol si* beneath; 1-2); G. punicea (*c-h, fl r*; *fol si* or *r-br* beneath; 4); G. rosmarinifolia (*c-h, fl r*; 4); G. sericea (*c-h, fl pi*; 6); G. Thelemanniana (*c-h, fl r* and *y*; 3-5); Grewia occidentalis (*c-h, fl p*; 10); Guettarda odorata (*st, fl r, sc* at night; 6-10); Gustavia insignis (*st, fl c-w*, tinged *pi*; filaments *pi*; anthers *o*; 3-4); G. pterocarpa (*st, fl w*; 6); Hakea cucullata (*c-h; fl r*); H. dactyloides (*c-h, fl w*; 7); H. nitida (*c-h, fl w*; 6-8); H. suaveolens (*c-h, fl w*; 4); Heinsia jasminiflora (*st, fl w*; 5-8); Heliotropium corymbosum (*c-h, fl l*; 4); Hermannia flammea (*c-h, fl o* or *r*; 1-3); Hibbertia perfoliata (*c-h, fl y*; 2); H. stricta (*c-h, fl y*); Hibiscus marmoratus (*c-h, fl w*, mottled *pi*); H. rosa-sinensis (*st*; 10-15) and vars.; H. schizopetalus (*st, fl o-r*); Hoffmannia discolor (*st, fol* velvety *g* above, *r-p* below; 6); H. Ghiesbreghtii* (*c-h, fol* velvety above, *r-p* below; 2-4); H. refulgens (*c-h, fl r*; *fol g* suffused *r* above, *r* below; 1-2); Homalomena Roezlii (*st, fol* blotched *y*; 6); H. Wallisii (*st, fol* edged *w*, blotched *y* above); Hovea elliptica (*c-h, fl b*; 2-4); H. pungens (*c-h, fl b*; 1-2); Hypericum balearicum (*c-h, fl y*; 1-2); Hypocalyptus obcordatus (*c-h, fl p*; 1-2); Indigofera australis (*c-h, fl pi*; 3-4); I. decora (*c-h, fl r*, 3); I. tinctoria (*st, fl r*; 4-6); Iochroma fuchsioides (*c-h, fl o-r*; 5); I. lanceolata (*c-h, fl p-b*; 4-5); Ixora chelsoni (*st, fl o-pi*); I. coccinea (*st, fl r*; 3-4); I. Colei (*st, fl w*); I. concinna (*st, fl pi*); I. congesta (*st, o*; 4); I. decora (*st, y* and *pi-r*); I. Fraseri (*st, fl r* and *pi*); I. fulgens (*st, fl o-r*; 3-4); I. javanica (*st, fl o*; 3-4); I. macrothyrsa (*st, fl r*); I. Pilgrimii (*i-h, fl o-r*); I. princeps (*st, fl br-w*, changing to *r-o*); I. regina (*st, fl v-pi*); I. splendens (*st, fl br-r*); I. Williamsi (*st, fl r-pi*); Jacobinia Ghiesbreghtiana (*st, fl r*; 1-1½); Jasminum grandiflorum (*i-h, fl w*); Jatropha podagrica (*st, fl o-r*; 1½); Lachnea buxifolia (*c-h, fl p*; 2) and var.; L. purpurea (*c-h, fl p*; 2); Lagerströmia indica (*st, fl pi*; 6-10); Lambertia formosa (*c-h, fl r*); Leea amabilis (*st, fol*, upper surface bronzy *g*, striped *w*; lower surface *r*, striped *g*); Leonotis Leonurus (*c-h, fl r*; 3-6); Leschenaultia biloba (*c-h, fl b*; 1); L. formosa (*c-h, fl r*; 1); Leucopogon australis (*c-h, fl w*; 2-4); L. Richei (*c-h, fl w*; 3-4); L. verticillatus (*c-h, fl w* or *pi*; *fol pi* when young; 3-6); Libonia floribunda (*i-h, fl r*, tipped *y*); L. Penrhosiensis (*i-h, fl r*); Lightfootia ciliata (*c-h, fl b*; ¾); Lindenia rivalis (*st, fl w* and *r*; 3); Liparia parva angustifolia (*c-h, fl y*); Lisianthus princeps (*c-h, fl. r, y*, and *g*); L. pulcher (*c-h, fl r*; 5); Lomatia ferruginea (*c-h*; 10); L. silaifolia (*c-h, fl w*; 2); Luculia gratissima (*c-h, fl pi, sc*; 9-16); L. Pinceana (*c-h, fl w, sc*); Macleania pulchra (*c-h, fl y* and *r*; *fol* tinged *r* when young); M. speciosissima (*c-h, fl r* and *y*; *fol* tinged *r* when young); Magnolia fuscata (*c-h, fl p, sc*; 2-4); Mahernia incisa (*c-h, fl r*, turning *o*, then *y*; 2-4); Mascarenhasia Curnoviana (*st, fl r*); Medinilla amabilis (*st, fl pi*); M. Curtisii (*st, fl w*; stamens *p*); M. magnifica (*st, fl pi*; 3); Melianthus major (*c-h, fl br*); Meriania rosea (*st, fl* varying from *w* and *r* to *pi* and *p*; 30); Miconia flammea (*st, fol*); M. Hookeriana (*st, fol* olive-*g*, marked *si*); Microcachrys tetragona (*c-h*, cones *r*); Mimulus glutinosus (*c-h, fl br* or *pi*; 5); M. g. puniceus (*c-h, fl* varying from *o-r* to *r*); Mitriostigma axillare (*st, fl w, sc*; 5); Monochætum alpestre (*c-h, fl r*); M. Hartwegianum (*c-h, fl pi*); M. Humboldtianum (*c-h, fl r-p*); M. sericeum multiflorum (*c-h, fl mv*); Monsonia speciosa* (*c-h, fl pi, p*, and *g*; ½); Montanoa bipinnatifida (*c-h, fl y*, 6-8); Morinda jasminoides (*st, fl br*; 6); Muraltia Heisteria (*c-h, fl p*; 2-3); Mussænda luteola (*c-h, fl y*; 5-6); Myrtus bullata (*c-h, fl pi*; 10-15); M. Luma (*c-h, fl w*; 3); M. Ugni (*c-h, fl w*; 4); Nepenthes atrosanguinea (*st*, pitchers *r*, spotted *y*); N. bicalcarata (*st*, pitchers *br*-downy when young); N. coccinea (*st*, pitchers *r, y, g*, and *bk*); N. Courtii (*st*, pitchers *gy-g*, spotted *r*); N. Dormanniana (*st*, pitchers *g*, blotched *r*); N. Hookeriana (*st*, pitchers spotted *r*); N. intermedia (*st*, pitchers *g*, spotted *r*); N. Kennedyana (*st*, pitchers *r* and *gl-v*); N. Khasiana (*st, fl g, y*; pitchers *g*, marked *p*); N. Lawrenciana (*st*, pitchers *g*, spotted *r*); N. madagascariensis (*st*, pitchers *r* and *c*); N. Mastersiana (*st*, pitchers *r, pi-c*, and *p*); N. Morganiæ (*st*, pitchers *r* and *g*); N. Northiana (*st*, pitchers spotted *p* and *bk*); N. Rafflesiana (*st, fl* and pitchers *y* and *br*); N. Rajah (*st*, pitchers *p*); N. Ratcliffiana (*st*, pitchers *g*, spotted *r*); N. rubro-maculata (*st*, pitchers *y-g*, spotted *r*); N. sanguinea (*st*, pitchers *r*); N. Sedeni (*st*, pitchers *g*, marked *br-r*); N. Veitchii (*st*, pitchers); N. Williamsii (*st*, pitchers spotted *r*); Nerium Oleander (*c-h, fl r*; 6-14); Nicotiana glauca (*c-h, fl y*; 10-20); N. wigandioides (*c-h, fl y-w*); Notospartium Carmichæliæ (*c-h, fl pi*; 20); Osbeckia glauca (*st, fl r* or *p*; 2); O. rostrata (*st, fl pi*); Oxyanthus tubiflorus (*st, fl w*; 3-4); Oxylobium Callistachys (*c-h, fl y*; 3-4); O. cuneatum obovatum (*c-h, fl y*, or *y* and *p*; 2); O. ellipticum (*c-h, fl y*; 2-3); O. obtusifolium (*c-h, fl r, o*, and *y*; 1-3); O. trilobatum (*c-h, fl y*; 2); Ozothamnus rosmarinifolius (*c-h, fl w*; 8-9); Panax diffusum (*st*; 2); P. dumosum (*st*; ½-1½); P. laciniatum (*st, fol* marked *br*); P. plumatum (*st*); P. Victoriæ (*st, fol* edged *w*); Pentapterygium flavum (*c-h, fl y*, margined *r*; 1-3); P. rugosum (*c-h, fl w*, marked *p* or *r*; 1-3); Pentas carnea* (*st, fl w-pi*; 1½); P. c. kermesina (*st, fl r-pi*, tinged *v*); Persoonia ferruginea (*c-h, fl y*; 3); P. longifolia (*c-h, fl y*; 10-20); P. rigida (*c-h, fl y*; 3-4); Petræa arborea (*st, fl b* and *v*; 12); Petrophila acicularis (*c-h, fl w, r*; 2); Phænocoma prolifera (*c-h, fl r*; 4); Philesia buxifolia (*c-h, fl r*; 4); Phlogacanthus asperulus (*st, fl p-r*; 3); P. curviflorus (*st, fl y*; 3-6); Phygelius capensis (*c-h, fl r*; 3); Phylica plumosa squarrosa (*c-h, fl w*; 2); Phyllanthus Chantrieri (*st, fl r, y*-hairy); P. pallidifolius (*st, fl r* and *y*); Phyllostachys nigra (*c-h*; 4-25); Pimelea ferruginea (*c-h, fl pi* or *r*; 1-2); P. hispida (*c-h, fl w-pi*; 2-4); P. rosea (*c-h, fl pi* or *w*; 2); P. spectabilis (*c-h, fl w*, tinged *pi*; 3-4); P. suaveolens (*c-h, fl y*; 1-3); Piper excelsum aureum-pictum (*c-h, fol* blotched *c*); Pittosporum viridiflorum (*c-h, fl g-y, sc*; 6); Platylobium formosum (*c-h, fl y*; 4); P. triangulare (*c-h, fl y*; 1); Pleroma Benthamianum (*st, fl p*; 4); P. elegans (*st, fl b*; 5); P. sarmentosum* (*c-h, fl v* or *v-p*; 1-2); Podalyria calyptrata (*c-h, fl p*; 6); Polygala myrtifolia grandiflora (*c-h, fl p*; 4-6); P. oppositifolia (*c-h, fl p* and *y-g*); Pomaderris apetala (*c-h, fl g*; 3-6); Portlandia platantha (*st, fl w*, tinged *r, sc*; 10-14); Posoqueria fragrantissima (*st, fl w, sc*); P. multiflora (*st, fl w, sc*); Prostanthera nivea (*c-h, fl w* or tinged *b*; 3-6); P. violacea (*c-h, fl b-p*; 4); Protea formosa (*c-h, fl v* and *pi*; *fol* margined *pi*; 6); P. mellifera (*c-h, fl pi* or *w*; 6); P. pulchella (*c-h, fl r*; *fol* margined *bk*; 3); P. Scolymus (*c-h, fl p*; 3); Psammisia Hookeriana (*st, fl pi-r*; 1½-2);

Evergreen (Tender)—*continued.*

P. Jessicæ (*st, fl r*); Psidium Cattleyanum (*st, fl w*; 10-20); Psoralea aculeata (*c-h, fl b* and *w*; 2-3); P. pinnata (*c-h, fl b*; 3-6); P. jasminiflora (*st, fl w*; *fol w*-tomentose beneath); Pultenæa obcordata (*c-h, fl y*; 2); P. rosea (*c-h, fl pi*; 2); P. stricta (*c-h, fl y*; 1-3); P. villosa (*c-h, fl y*; 1-3); Rafnia triflora (*c-h, fl y*; 2-4); Regelia ciliata (*c-h, fl r*; 3-5); Reinwardtia trigynum (*i-h, fl y*; 2-3); Rhododendron Aucklandii (*c-h, fl w* and *y*, tinged *pi*; 4-8); R. blandfordiæflorum (*c-h, fl r*, or *g* becoming *o-r* or *r*; 8); R. Brookeanum gracilis (*st, fl y*); R. calophyllum (*c-h, fl w*, tinged *y-g*; *fol*, under side *gl*, becoming ferruginous; 3); R. campylocarpum (*c-h, fl g-y, sc*; 6); R. Edgeworthii (*c-h, fl w*, often tinged *w-pi* or *y, sc*; 2); R. formosum (*c-h, fl w*, tinged *p* and *y*; 3-8); R. Hookeri (*c-h, fl r*; 12-14); R. jasminiflorum (*c-h, fl w*, tinged *pi*; anthers *r*; 2); R. javanicum (*c-h, fl o*, spotted *r*; *fol br*-scaly dotted beneath; 4); R. Nuttallii (*c-h, fl w, sc*; 12-30); R. Thomsoni (*c-h, fl r*; 6-10); Rhodomyrtus tomentosa (*c-h, fl pi*; 5; Rhus succedanea (*c-h, fl g-y*; *fol gl* beneath; 10-15); Rivina humilis (*st, fl w-pi*; *fr r*; 1-2); R. lævis (*st, fl w-pi*; *fr r*; 7-8); Roezlia granadensis (*st, fl r-p*; 3); Rondeletia amœna (*st, fl pi*; 4); R. cordata (*st, fl pi*; 4); R. gratissima (*i-h, fl pi, sc*); R. odorata (*st, fl r, sc*; 3); R. Purdiei (*st, fl y, sc*; 4); Ruellia Baikiei* (*st, fl r*; 3); R. Herbstii (*st, fl pi-p* and *w*; *fol*, upper leaves *p* beneath; 3); R. macrophylla* (*st, fl r*; 3-4); R. speciosa (*st, fl r*; 20); Russelia juncea (*st, fl r*; 3-4); R. sarmentosa (*st, fl r*; 4); Salvia albo-cærulea* (*c-h, fl w* and *b*; 3); S. chamædryoides (*c-h, fl b*; 1); S. confertiflora* (*c-h, fl r* and *y*; 3); S. fulgens (*c-h, fl r*; 2-3); Sanchezia nobilis* (*st, fl y*; bracts *r*; 1-3); S. n. glaucophylla (*st, fol gl-g*, striped *w* or *y*); Scævola Kœnigii (*c-h, fl r*; 2); Scutellaria Hartwegi (*st, fl r* and *v*; 1-2); S. Mociniana (*st, fl r* and *y*; 1½); Selago Gillii* (*c-h, fl pi*; 6); Sempervivum aureum* (*c-h, fl y*; *fol gl*; 1); S. canariense (*c-h, fl w*; 1½); S. tabulæforme (*c-h, fl g-y*; 1); Senecio argenteus* (*c-h, fl y*; 1-2); S. chordifolia* (*c-h, fl y*; 1); Sida inæqualis (*st, fl w*; 7); Siphocampylos coccineus* (*st, fl r*; 3); S. manettiæflorus* (*st, fl r* and *y*; 1); Solanum acanthodes (*st, fl b-p*; 3-6); S. atropurpureum* (*c-h, fl* tinged *p* and *y*); S. Capsicastrum* (*c-h, fr r*; 1-2); S. Pseudo-capsicum (*c-h, fr r*, sometimes *y*; 4); S. pyracanthum* (*c-h, fl b-v*; 3-6); Sophora secundiflora (*c-h, fl v*; 6); Sphæralcea elegans* (*c-h, fl* veined *p*; 3); S. miniata* (*c-h, fl r*; 1); Spiranthera odoratissima (*st, fl w, sc*; 6); Sprengelia incarnata (*c-h, fl p*; 2); S. Ponceletia (*c-h, fl r*; 1); Stachytarpheta mutabilis* (*st, fl r*, at length *pi*; 3); Statice arborescens (*c-h, fl b*; 2); Stenanthera pinifolia (*c-h, fl r, y*, and *g*; 2-3); Steriphoma cleomoides (*st, fl y*; 6); Streptosolen Jamesonii (*c-h, fl o*; 4); Strobilanthes anisophyllus* (*st, fl b-p*; 2-3); S. glomeratus* (*st, fl p*; 2-6); S. isophyllus* (*st, fl b-p*, 1-2); S. Wallichii* (*st, fl b*; ½-2); Styphelia tubiflora (*c-h, fl r*; 5); Tabernæmontana Barteri (*st, fl w*; 6); T. coronaria (*st, fl w, sc* at night; 4); Tetratheca hirsuta (*c-h, fl pi*; ½-1½); T. pilosa (*c-h, fl p*; 1-1½); Teucrium fruticans (*c-h, fl b*; 2-3); Thomasia macrocarpa (*c-h, fl r*; 3); Thyrsacanthus bracteolatus (*st, fl r*; 2); T. callistachyus (*st, fl r*; 2); T. rutilans (*st, fl r*; 2); T. Schomburgkianus (*st, fl r*; 3); Tinnea æthiopica (*st, fl r-p*; 4-6); Toxicophlæa spectabilis (*c-h, fl w, sc*; 4-6); Ursinia crithmifolia (*c-h, fl y*; 1-2); Vaccinium caracasanum (*c-h, fl r-w*; 4); V. erythrinum (*i-h, fl r*; *fol*, when young, stained *r*; 1½); V. leucobotrys, (*c-h, fl w*; *fr w*, spotted; 4-7); Vitex Lindeni (*st, fl l*, streaked *r*); Westringia rosmariniformis (*c-h, fl b*; *fol* hoary or *si-w* beneath; 2); Whitfieldia lateritia (*st, fl o-r* or *r*; 3); Zieria Smithii (*c-h, fl w*).

DECIDUOUS CLIMBERS.— Hardy.— Actinidia Kolomikta (*fl w*; *fol* turning *w* and *r*); A. volubilis (*fl w*); Ampelopsis quinquefolia (*fl g-p*; *fol* turning *r*; grown as a climber, but really a creeper); A. tricuspidata (*fol* turning *r* and *y*); Aristolochia Sipho (*fl y-br*); A. tomentosa (*fl p*); Atragene alpina (*fl b*, varying to *w*); A. americana (*fl p-b*); Berchemia volubilis (*fl g-w*); Celastrus scandens (*fl y*);

Deciduous Climbers (Hardy)—*continued.*

Clematis cærulea (*fl v*; stamens *p*) and vars.; C. Flammula (*fl w, sc*); C. florida (*fl w*); C. Fortunei (*fl w, sc*); C. graveolens (*fl y*); C. lanuginosa (*fl b*); C. paniculata (*fl w, sc*); C. virginiana (*fl w, sc*); C. Vitalba (*fl w, sc*); C. Viticella (*fl b, p*, or *pi*); Convolvulus Scammonia (*fl c*); Decumaria barbara (*fl w, sc*); Jasminum nudiflorum (*fl y*); Lonicera Caprifolium (*fl y* and *b, sc*); L. flava (*fl y, sc*); L. flexuosa (*fl y, sc*); L. Periclymenum (*fl r* outside); Periploca græca (*fl g* and *br*); Rosa moschata (*fl y-w*); R. multiflora (*fl w, pi*, or *p*); Tecoma radicans (*fl r*); Vitis æstivalis (*fl g, sc*; *fr bk*); V. Labrusca (*fl g, sc*; *fr p* or *y*); Wistaria chinensis (*fl b*); W. japonica (*fl w*).

Half-hardy.—Bomarea Caldasiana (*fl o-y* and *r*); B. Carderi (*fl pi* and *p-br*); B. oligantha (*fl r* and *y*); B. Shuttleworthii (*fl o-r, g, y*, and *r*); B. Williamsii (*fl pi*); Clematis montana (*fl w*); Rosa Banksiæ (*fl w, sc*); Rubus australis (*fl pi* or *w, sc*).

Tender.—Aloysia citriodora (*c-h, fl w* or *l*; *fol g, sc*); Aristolochia Goldieana (*st, fl g, y*, and *br*); Batatas bignonioides (*st, fl p*); B. Cavanillesii (*st, fl w-r*); B. paniculata (*st, fl p*); Gonolobus carolinensis (*c-h, fl p*); Lapageria rosea (*c-h, fl r-pi*); L. r. alba (*c-h, fl w*); L. r. superba (*c-h, fl r*); Solanum jasminoides (*c-h, fl b-w*); Tecoma grandiflora (*c-h, fl r*); Testudinaria elephantipes (*c-h, fl g-y*).

EVERGREEN CLIMBERS.—Hardy.— Clematis crispa (*fl l* or *p*); Hedera Helix algeriensis (*fol y-g*); H. H. aurantia (*fr r-o*; *fol gy-g*); H. H. chrysocarpa (*fol gy-g*); H. H. Donerailensis (*fol.* turning *p-br*); H. H. Rægneriana; H. H. rhombea (*fol* margined *c-w*); Jasminum officinale (*fl w, sc*); J. revolutum (*fl y, sc*); Passiflora cærulea (*fr y*); Rosa sempervirens (*fl w, sc*); Smilax aspera (*fl w* or *pi-w, sc*); S. rotundifolia (*fl g*).

Half-hardy.—Berberidopsis corallina (*fl r*); Bignonia capreolata (*fl o*); Clematis indivisa (*fl w* and *c*); Clianthus puniceus (*fl r*); Eccremocarpus longiflorus (*fl y* and *g*); E scaber (*fl r* or *o-r*); Ficus stipulata; Mitraria coccinea (*fl r*); Pentstemon cordifolius* (*fl r*); Smilax aspera mauritanica (*fl g-y, sc*); Tecoma australis (*fl y-w*, tinged *p* or *r*); T. capensis (*fl o-r*).

Tender.—Abutilon Darwini (*i-h, fl o*); A. megapotamicum (*c-h, fl r, y*, and *br*); A. pulchellum (*c-h, fl w*); A. venosum (*c-h, fl o*, veined *r*); A. varieties (*c-h*); Adelobotrys Lindeni (*st, fl w*, turning *p*); Adenocalymna comosum (*st, fl y*); A. nitidum (*st, fl y*); Adhatoda cydoniæfolia (*st, fl w* and *p*); Æschynanthus Lobbianus (*st, fl r, sc*); Æ. pulcher (*st, fl r, sc*); Aganosma acuminata (*st, fl w, sc*); A. caryophyllata (*st, fl y*, tinged *r, sc*; A. elegans (*st, fl p*); A. marginata (*st, fl w, sc*); A. Roxburghii (*st, fl w, sc*); A. Wallichii (*st, fl w, sc*); Akebia quinata (*c-h, fl p-br, sc*); Allamanda Aubletii (*st, fl y*); A. cathartica (*st, fl y*); A. chelsoni (*st, fl y*); A. grandiflora (*st, fl y*); A. nobilis (*st, fl y*); A. Schottii (*st, fl y*); Amerimnon Brownei (*st, fl w, sc*); Amphilophium paniculatum (*st, fl pi*); Anemopægma racemosum (*st, fl y*); Antigonon amabile (*st, fl pi*); A. insigne (*st, fl pi*); Argyreia cymosa (*st, fl pi*); A. speciosa (*st, fl pi*); A. splendens (*st, fl r*); Aristolochia odoratissima (*st, fl p, sc*); Asparagus plumosus (*c-h, fl w*; *fol*); Astephanus triflorus (*c-h, fl w*); Asystasia scandens (*st, fl c*); Banisteria chrysophylla (*st, fl o*; *fol y*-downy beneath); B. ciliata (*st, fl o*); B. fulgens (*st, fl y*); B. splendens (*st, fl y*); Bauhinia corymbosa (*st, fl pi*); Beaumontia grandiflora (*st, fl w* and *g*); Begonia scandens (*st, fl w*; *fol* shining *g*); Besleria coccinea (*st, fl y*; bracts *r*); Bignonia æquinoxialis Chamberlaynii (*st, fl y*); B. Clematis (*st, fl w, y*, and *r*); B. floribunda (*st, fl p*); B. magnifica (*st, fl mv* and *y*, varying to *p-r* and *y*); B. pallida (*st, fl y* and *l*); B. variabilis (*st, fl g-y* and *w*); Billiardiera longiflora (*c-h, fl g-y*, changing to *p*); B. scandens (*c-h, fl c*, changing to *p*); Bougainvillea glabra (*st*, bracts *pi*); B. speciosa (*st*, bracts *l-pi*); Brachysema latifolium (*c-h, fl r*); B. undulatum (*c-h, fl br-v*); Cacoucia coccinea (*st, fl r*); Cestrum elegans (*c-h, fl p-r*) and var.; Cissampelos mauritiana (*st, fl y* and *g*;

Evergreen Climbers (Tender)—*continued.*

Clematis caripensis (*st, fl w, sc*); C. grandiflora (*st, fl g-y*); Clerodendron scandens (*st, fl w*); Clitoria heterophylla (*st, fl b*); C. ternatea (*st, fl b*, marked *w*); Cobæa penduliflora (*i-h, fl g*); C. scandens (*c-h, fl p*); Colquhounia coccinea (*c-h, fl r*); Combretum elegans (*st, fl y*); C. laxum (*st, fl r* or *y*); C. racemosum (*st, fl w*); Convolvulus pannifolius (*c-h, fl c-p* and *w*); Cryptostegia grandiflora (*st, fl r-p*); Dolichos lignosus (*c-h, fl pi* and *p*); Echites atropurpurea (*st, fl br*); E. franciscea sulphurea (*st, fl g-y, r,* and *pi*); E. stellaris (*st, fl pi* and *y*); Hibbertia dentata (*c-h, fl g*); Hoya australis (*st, fl w*, tinged *pi, sc*); H. carnosa (*st, fl pi-w*); H. cinnamomifolia (*st, fl y-y* and *p-r*); H. Cumingiana (*st, fl g-y*, or *w*, and *p-br*); H. globulosa (*st, fl c* and *pi*); H. imperialis (*st, fl r-br*); H. pallida (*st, fl y* and *pi, sc*); H. Pottsii (*st, fl y*, tinged *p, sc*); H. Shepherdi (*st, fl w* and *pi*); Ipomœa Bona-nox (*st, fl w*); I. Horsfalliæ (*st, fl pi*); I. Learii (*st, fl b*); I. rubro-cærulea (*st, fl w* and *r*, becoming *b*); Jasminum Sambac (*st, fl w, sc*); Lonicera sempervirens (*c-h, fl r* and *y*; *fol gl* beneath); Metrosideros scandens (*c-h, fl w*); Mikania scandens (*st, fl y-w*); Millettia megasperma (*c-h, fl p*); Oxypetalum cæruleum * (*st, fl b*); Passiflora alata (*st, fl r, p,* and *w, sc*); P. alba (*st, fl w*); P. amabilis (*st, fl r*); P. cæruleo-racemosa (*c-h, fl p*); P. cincinnata (*c-h, fl c-p* and *w*); P. cinnabarina (*st, fl r*); P. coccinea (*st, fl r* and *o*); P. edulis (*st, fl w, sc*; *fr p*); P. Hahnii (*c-h, fl w* and *y*); P. Innesii (*st, fl w, r,* and *v*); P. quadrangularis (*st, fl w, r,* and *v, sc*); P. racemosa (*st, fl r*; *fol gl* beneath); P. Raddiana (*st, fl r* and *p*; *fol* vinous beneath); Petræa volubilis (*st, fl p*); Philibertia gracilis * (*c-h, fl y*, striped *r*); Physianthus albens (Araujia sericofera) (*c-h, fl w*, tinged *r*); Physostelma Wallichii (*st, fl g, y*); Piper porphyrophyllum (*st, fol* above bronzy *g*, spotted *pi*; below *p*); Pleroma macranthum (*c-h, fl c-p*); Plumbago capensis (*st, fl b*); Pronaya elegans (*c-h, fl b* or *w*); Proustia pyrifolia (*c-h, fl w*); Quisqualis indica (*st, fl* varying from *o* to *r, sc*); Randia macrantha (*st, fl y*); Smilax ornata (*c-h, fol* spotted *si-gy*); Solandra grandiflora (*st, fl g-w*); Sollya heterophylla (*c-h, fl b*); S. parviflora (*c-h, fl b*); Stephanotis floribunda (*st, fl w, sc*); Stigmaphyllon ciliatum (*st, fl y*; *fol gl*); S. littorale (*st, fl y*); Tacsonia insignis (*i-h, fl v, r, g,* and *b*); T. manicata (*st, fl r*); T. mollissima (*c-h, fl pi*); T. Van-Volxemii (*i-h, fl r*); Tecoma filicifolium (*st, fol*); Trachelospermum jasminoides (*c-h, fl w, sc*; *fol* when young, *y-g*).

DECIDUOUS TRAILERS.—Hardy.—Arctostaphylos alpina (*fl w* or *pi-w*); Pyxidanthera barbulata * (*fl w* or *pi*); Rubus fruticosus (*fl w* or *pi*; *fr bk* or *r-p*).

EVERGREEN TRAILERS.—Hardy.—Arctostaphylos Uva-ursi (*fl pi-w* and *r*); Astragalus monspessulanus * (*fl p*); Aubrietia deltoidea (*fl p*) and vars.; Cassiope hypnoides (*fl r* and *w*); C. virginica (*fl b*); Dryas Drummondi (*fl g-y*); D. octopetala (*fl w,* stamens *y*); Epigæa repens (*fl w*, tinged *r, sc*); Ercilla spicata (*fl p*); Frankenia lævis (*fl w-pi*); Fuchsia procumbens (*fl y* and *b*; *fr r*); Juniperus procumbens (*fol gl*); J. Sabina and var.; Linnæa borealis * (*fl pi-w*); Lithospermum prostratum (*fl b*, striped *r-v*); Oxycoccus macrocarpus (*fl pi*); O. palustris (*fl pi*); Rosa sinica (*fl w*); Vaccinium Vitis-Idæa (*fl pi*; *fr r*; *fol* dotted beneath).

Tender.—Begonia prismatocarpa (*st, fl o* and *y*; *fol* shining *g*); Bertolonia maculata (*st, fl v-p*); Blepharis procumbens (*c-h, fl b*); Calceolaria scabiosæfolia (*c-h, fl y*); Ficus barbata (*st*); Hoya bella (*st, fl w*, marked *r-pi*); H. linearis (*st, fl w*); Othonna crassifolia (*c-h, fl y*); Podanthes geminata (*st, fl o-y*, dotted *r*); Protea cordata (*c-h, fl p*); P. cynaroides glabrata (*c-h, fl w, g,* and *pi*); Sarmienta repens (*c-h, fl r*); Senecio mikanioides * (*c-h, fl y*); Solanum Seaforthianum (*st, fl r* or *l*); Tephrosia capensis (*c-h, fl p*).

AN INDEX TO FLOWERING PERIODS.

THE object of this section of the Supplement is to enable the gardener to ascertain at a glance the most desirable Shrubs and Herbaceous Plants that are in blossom at any given period of the year, so that suitable subjects for successive flowering may be expeditiously selected, whether for outdoors or for culture under glass. Where in the body of the DICTIONARY OF GARDENING the flowering periods are given as Spring, Summer, Autumn, or Winter, they are understood to be: Spring, from March to May; Summer, from June to August; Autumn, from September to November; and Winter, from December to February.

The following are the abbreviations used:—

b, blue; *bk*, black; *br*, brown; *c*, cream; *c-h*, cool-house; *g*, green; *i-h*, intermediate-house; *l*, lilac; *m*, magenta; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *sc*, scented; *si*, silvery; *st*, stove; *v*, violet; *w*, white; *y*, yellow.

The heights are given in feet and fractions of a foot.

JANUARY. — **Hardy.** — PERENNIALS.—Acis trichophyllus (*w*; ½); Arabis albida (*w*; ½-¾); Eranthis hyemalis (*y*; ¼-¾); Helleborus niger (*w*; ½-1½).

SHRUBS.—Abutilon striatum (*o-y*; 10); Chimonanthus fragrans (*w* or *y*, and *p*, *sc*); Daphne Laureola (*y-g*; 3-4); Erica carnea (*r*; ½); Hamamelis arborea (*y* and *p*; 15-20); H. virginica (*y*); Jasminum nudiflorum (*y*); Kerria japonica (*o-y*; 3-4); Rosa indica (*r*; 4-20); Viburnum Tinus (*w* or *pi*; 8-10).

Half-hardy.—PERENNIALS.—Calceolaria Burbidgei (*y*; 2-4); Caliphruria subedentata (*w*; 1½).

SHRUBS.—Grindelia glutinosa (*y*; 2); Plagianthus Lampenii (*y*; 6-8).

Tender. — ANNUALS. — Acroclinium roseum (*c-h*, *pi*; 1-2); Whitfieldia lateritia (*st*, *r* and *o*; 3).

PERENNIALS. — Æchmea cœlestis (*st*, *b*); Angræcum sesquipedale (*st*, *w*; 1); Arpophyllum spicatum (*c-h*, *r*); Barkeria elegans (*c-h*, *pi* and *r*, spotted; 2); Begonia Berkeleyi (*i-h*, *pi*); B. Frœbeli (*i-h*, *r*); B. manicata (*st*, *pi*; 2); B. megaphylla (*i-h*, *w*); B. natalensis (*c-h*, *pi*; 1½); B. nelumbiifolia (*i-h*, *w* or *pi*; 1-2); B. pruinata (*i-h*, *w*); B. ricinifolia (*i-h*); B. Schmidtiana (*i-h*, *w*; 1); B. semperflorens (*i-h*, *w* or *pi*); B. socotrana (*st*, *pi*); B. Verschaffeltiana (*i-h*, *pi*); Billbergia Liboniana (*st*, *r*, *w*, and *p*; 1); B. rosea-marginata (*st*, *b* and *pi*; 1½); Bletia Shepherdii (*st*, *p* and *y*; 2); Brassavola Digbyana (*i-h*, *c-w*, streaked *p*; ¾); Brassia Lanceana (*i-h*, *y* and *br*, *sc*; ¾) and var.; Burlingtonia decora (*st*, *w* or *pi*, spotted *r*); Calanthe Veitchii (*st*, *p* and *w*; 3); Camellia japonica (*c-h*, variable; 20) and vars.; Canarina Campanula (*c-h*, *y-p* or *o*; 3-4); Cattleya maxima (*i-h*, *pi*, *w*, *p-r*, &c.; 1-1½); C. Trianæ (*i-h*, *pi-w*, *o* or *y*, and *p*) and vars.; C. Warscewiczii (*i-h*, *pi-w* and *r*; 1); Centropogon Lucyanus (*st*, *pi*); Cephaelis Ipecacuanha (*st*, *w*; ½); Cœlogyne cristata (*i-h*, *w* and *y*, *sc*; ¾); C. flaccida (*i-h*, *w*, *y*, and *r*, *sc*; 1); C. Gardneriana (*st*, *w* and *g-y*); C. Gowerii (*i-h*, *w* and *g-y*); C. media (*i-h*, *c-w*, *y*, and *br*; 1); C. odoratissima (*i-h*, *w* and *y*, *sc*); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); Cyanotis Kewensis (*st*, *pi*); Cymbidium giganteum (*st*, *br*, *y*, and *p*); C. Mastersii (*i-h*, *w* and *pi*, *sc*); Cypripedium Haynaldianum (*st*, *g*, *pi*, *w*, and *br*); C. insigne (*i-h*, *y-g*, *w*, *y*, and *r-br*) and var.; C. venustum (*c-h*, *g-w* or *pi*, and *y-g*); Cyrtochilum maculatum (*st*, *g* and *p*); Dendrobium endocharis (*st*, *w* and *br*); D. Fytchianum (*st*, *w*); D. Linawianum (*c-h*, *pi-l* and *r*); D. nobile (*c-h*, *w*, *pi*, and *r*, *sc*); D. Pierardii (*c-h*, *c-w* or *pi*, *y*, and *p*); Eulophia macrostachya (*st*, *y* and *r-p*); Gesnera exoniensis (*st*, *o-r*); G. pyramidalis (*st*, *o-r* and *r*); Goodyera discolor (*c-h*, *w* and *g-y*); Grammatophyllum speciosum (*st*, *o-y*, *p*, and *r*; 10); Gymnostachyum ceylanicum (*st*, *w*, *g*, and *y*); Imantophyllum cyrtanthiflorum *c-h*, *pi* or *y*); I. Gardeni (*c-h*, *r-o* or *y*); Impatiens Hookeriana (*st*, *w* and *r*; 2½); I. Sultani (*st*, *r*); 1); I. Walkeri (*st*, *r*; 1-1½); Ipomœa Horsfalliæ (*st*, *pi*); Lælia albida (*i-h*, *w*, *pi*, and *y*, *sc*); L. anceps (*c-h*, *pi-l*, *p*, and *l*, *sc*); L. autumnalis (*i-h*, *pi*, *pi-w*, and *y*, *sc*); L. superbiens (*i-h*, *pi*, *r*, and *y*); Lycaste aromatica (*i-h*, *y*); L. Deppei (*i-h*, *y*, *br*, *w*, and *r*); L. Skinneri (*i-h*, *w*, *pi-l*,

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and *r*); Masdevallia coccinea (*c-h*, *y* and *r*); M. Lindeni (*c-h*, *w*, *pi*, and *m*); M. tovarensis (*c-h*, *w*); M. Veitchiana (*c-h*, *y*, *o-r*, and *p*); Maxillaria luteo-grandiflora (*i-h*, *c-w*, *br-r*, and *o*); M. venusta (*i-h*, *w*, *y*, and *r*); Nymphæa Devoniensis (*st aq*, *pi-r*); Odontoglossum crispum (*c-h*, *w*, *y*, and *r-br*); O. grande (*c-h*, *o-y*, *c-w*, and *br*); O. Insleayi (*i-h*, *y*, *br*, &c.); O. luteo-purpureum (*c-h*, *br* or *p*, *w*, and *y*); O. odoratum (*c-h*, *y*, *br*, and *p*, *sc*); O. Rossii (*c-h*, *w*, *br*, and *y*); O. R. Ehrenbergii (*c-h*, *w* and *br*); O. R. Warnerianum (*c-h*, *w*, *br*, *y*, &c.); Oncidium bicallosum (*i-h*, *br* and *y*); O. bifolium (*st*, *g-br* and *y*); O. Cavendishianum (*st*, *y*); O. crispum (*i-h*, *br* and *y*); O. cucullatum (*c-h*, *br-p* and *pi-p*); O. dasystyle (*i-h*, ochre, *br-p*, and *p*); O. incurvum (*c-h*, *w*, *l*, and *br*, *sc*); O. leucochilum (*i-h*, *g*, *br* or *r*, and *w* or *y*); O. ornithorhynchum (*c-h*, *pi-p*, *sc*); O. o. albiflorum (*c-h*, *w*); O. tigrinum (*i-h*, *br* and *y*, *sc*); O. varicosum Rogersii (*i-h*, *y*); Peristrophe speciosa (*st*, *p*; 4); Phaius grandifolius (*st*, *br*, *w*, and *r-br*; 3); Phalænopsis Aphrodite (*st*, *w*, *r*, *o*, and *y*); Pterostylis Baptistii (*c-h*, *g*, *w*, and *br*; 1); Rivina humilis (*st*, *w-pi*; 1-2); Ruellia Portellæ (*i-h*, *pi*; 1); Saccolabium giganteum (*st*, *w* and *m-v*, *sc*); S. violaceum (*st*, *w* and *m*) and var.; Schomburgkia undulata (*st*, *b-p* and *p-v*); Sophronitis grandiflora (*c-h*, *r*); S. violacea (*c-h*, *v*; ¼); Spathiglottis Fortunei (*c-h*, *y* and *r*); Talauma pumila (*st*, *c*, *sc*; 2-4); Thunbergia erecta (*st*, *b*, *o*, and *y*; 6) and var.; Tillandsia umbellata (*st*, *b*, *w*, and *g*; 1); Trichopilia fragrans (*c-h*, *y-g*, *w*, spotted *o*, *sc*); Zygopetalum brachypetalum (*i-h*, *br*, *w*, &c.); Z. candidum *i-h*, *w* and *pi-p*; ¾); Z. crinitum (*c-h*, *g*, *br*, *w*, and *y*); Z. Dayanum (*st*, *w*, *p-v*, and *r*) and vars.; Z. Gairianum (*st*, *v*, *p*, and *o*); Z. Gautieri (*c-h*, *g*, *br*, and *p-b*); Z. Klabochorum (*i-h*, *p*, *w*, and *y*); Z. Mackayi (*c-h*, *p*, *g*, *w*, and *b*); Z. maxillare (*c-h*, *br*, *b*, *p*, and *g*); Z. rostratum (*st*, *w*, *g*, *br-p*, &c.); Z. Sedeni (*i-h*, *p-br*, *g*, and *b-p*); Z. triumphans (*i-h*, *w* and *b*); Z. Wallisii (*c-h*, *w* and *v*).

SHRUBS.—Abutilon insigne (*ch*, *p-r*; 6); A. megapotamicum (*c-h*, *r*, *y*, and *br*; 3); Aristolochia Duchartrei (*st*, *br* and *c*; 5); Begonia incarnata (*st*, *pi*; 2); B. Lindleyana (*st*, *w*; 3); B. Lynchiana (*st*, *r*); B. nitida (*st*, *pi*; 4-5); B. prestoniensis (*st*, *o-r*; 2); Bouvardia jasminiflora (*c-h*, *w*, *sc*; 2); Brunfelsia eximia (*st*, *p*, *sc*; 2½); Crassula lactea (*c-h*, *w*; 1-2) and var.; Daphne odora Mazeli (*c-h*, *w* and *pi*, *sc*); Dianthera ciliata (*st*, *v* and *w*; 2); Echinopsis Eyriesii (*st*, *w* and *g*, *sc*); Epacris purpurascens (*c-h*, *w* and *r*; 2-3); Erica hyemalis (*c-h*, *pi* and *w*; 2); E. Linnæana (*c-h*, *w* and *r*; 1½); E. melanthera (*c-h*, *pi*; 2); Eupatorium atrorubens (*c-h*, *r* and *l*); E. ianthinum (*c-h*, *p*; 3); E. Weinmannianum (*c-h*, *w*, *sc*); Gardenia Thunbergia (*c-h*, *w*, *sc*; 4-5); Jasminum gracillimum (*st*, *w*, *sc*); J. Sambac (*st*, *w*, *sc*); Leonotis Leonurus (*c-h*, *r*; 3-6); Leucopogon australis (*c-h*, *w*; 2-4); L. Richei (*c-h*, *w*; 3-4); Libonia floribunda (*i-h*, *r* and *y*); L. Penrhosiensis (*i-h*, *r*); Mimulus glutinosus (*c-h*, *br* or *pi*; 5); Monochætum Hartwegianum (*c-h*, *pi*); Muraltia Heisteria (*c-h*, *p*; 2-3); Mussænda luteola (*c-h*, *y* and *o*; 5-6); Pentas carnea (*st*, *pi-w*; 1½); Pereskia Bleo (*st*, *r*; 8-10); Philodendron fragrantissimum (*st*, *c* and *r*); Phlogacanthus asperulus (*st*, *p-r*; 3); Pleroma macranthum (*st*, *v-p*); Rhododendron javanicum (*c-h*, *o* and *r*; 4); Ruellia Baikiei (*i-h*, *r*; 3); Stachytarpheta mutabilis (*st*, *r*; 3); Thyrsacanthus rutilans (*st*, *r*; 2); T. Schomburgkianus (*st*, *r*; 2); Whitfieldia lateritia (*st*, *r* and *o*; 3).

FEBRUARY. — Hardy. — PERENNIALS. — Anemone angulosa (*b*; ¾); Arabis albida (*w*; ½-¾); Bulbocodium vernum (*v-p*; ¼-½); Colchicum montanum (*l-p* or *w*; ¼); Corydalis cava (*p*; ½) and var.; Eranthis hyemalis (*y*; ¼-¾); Galanthus nivalis (*w*; ¼-½); Helleborus niger (*w*; ½-1½); Iris reticulata (*v-p* and *y*); Petasites fragrans (*w*, *sc*; ½); Scilla sibirica (*b*); Rosmarinus officinalis (*w* or *b-p*; 2-4).

SHRUBS.—Abutilon striatum (*o-y*; 10); Arctostaphylos pungens (*w*; 1); Corylopsis spicata (*y*, *sc*; 3-4); Daphne Laureola *y-g*; 3-4); D. Mezereum (*r*; 3-4); Enkianthus

February (Hardy Shrubs)—*continued.*

japonicus (*w*); Erica carnea (*r*; ½); Hamamelis arborea (*y* and *p*; 15-20); H. virginica (*y*); Jasminum nudiflorum (*y*); Kerria japonica (*o-y*; 3-4); Lonicera fragrantissima (*w*, *sc*; 6); Viburnum Tinus (*w* or *pi*; 8-10).

Half-hardy. — PERENNIALS. — Calceolaria Burbidgei (*y*; 2-4); Caliphruria subedentata (*w*; 1½).

SHRUBS.—Grindelia glutinosa (*y*; 2); Pittosporum undulatum (*w*; 10).

Tender.—ANNUALS.—Acroclinium roseum (*c-h*, *pi*; 1-2).

PERENNIALS. — Æchmea cœlestis (*st*, *b*); Æ. hystrix (*st*, *r*; 2½); Alströmeria caryophyllæa (*st*, *r*, *sc*; ¾-1); Arpophyllum spicatum (*c-h*, *r*); Aspasia lunata (*st*, *g*, *w*, and *br*; 1); A. variegata (*st*, *g*, spotted *y-r*; 9); Barkeria elegans (*c-h*, *pi* and *r*, spotted; 2); Begonia Berkeleyi (*i-h*, *pi*); B. Frœbeli (*i-h*; *r*); B. manicata (*st*, *pi*; 2); B. megaphylla (*i-h*, *w*); B. natalensis (*c-h*, *pi*; 1½); B. nelumbiifolia (*i-h*, *w* or *pi*; 1-2); B. pruinata (*i-h*, *w*); B. ricinifolia (*i-h*); B. Schmidtiana (*i-h*, *w*; 1); B. semperflorens (*i-h*, *w* or *pi*); B. socotrana (*st*, *pi*); B. Vershaffeltiana (*i-h*, *pi*); Billbergia Liboniana (*st*, *r*, *w*, and *p*; 1); B. Moreli (*st*, *r* and *p-v*; 1); Bletia Shepherdii (*st*, *p* and *y*; 2); Brassavola Digbyana (*i-h*, *c-w*, streaked *p*; ¾); Brassia caudata (*i-h*, *y* and *b*; 1); Burlingtonia decora (*st*, *w* or *pi*, spotted *r*); Calanthe Veitchii (*st*, *p* and *w*; 3); Camellia japonica (*c-h*, variable; 20) and vars.; Canarina Campanula (*c-h*, *y-p* or *o*; 3-4); Cattleya maxima (*i-h*, *pi*, *w*, *p-r*, &c.; 1-1½); C. Trianæ (*i-h*, *pi-w*, *o* or *y*, and *p*) and vars.; C. Warscewiczii (*i-h*, *p-w* and *r*; 1); Cœlogyne cristata (*i-h*, *w* and *y*, *sc*; ¾); C. Cumingii (*i-h*, *w* and *y*; 2); C. flaccida (*i-h*, *w*, *y*, and *r*, *sc*; 1); C. Gardneriana (*st*, *w* and *g-y*); C. Gowerii (*i-h*, *w* and *g-y*); C. media (*i-h*, *c-w*, *y*, and *br*; 1); C. odoratissima (*i-h*, *w* and *y*, *sc*); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); Cyanotis Kewensis (*st*, *pi*); Cyclamen Coum (*c-h*, *r*; ¼); C. ibericum (*c-h*, *r*; ¼); Cymbidium eburneum (*i-h*, *w* and *y*, *sc*); C. giganteum (*st*, *br*, *y*, and *p*); C. Mastersii (*i-h*, *w* and *pi*, *sc*); Cypripedium Haynaldianum (*st*, *g*, *pi*, *w*, and *br*); C. insigne (*i-h*, *y-g*, *w*, *y*, and *r-br*) and var.; C. venustum (*c-h*, *g-w* or *pi*, and *y-g*); Cyrtochilum maculatum (*st*, *g* and *p*); Dendrobium Ainsworthii (*st*, *w*, *pi*, and *p*, *sc*); D. aureum (*i-h*, *y*, *br*, and *p*); D. Boxallii (*st*, *w*, *p*, and *y*); D. crassinode (*st*, *w*, *p*, and *o*) and vars.; D. Kingianum (*c-h*, *v-p*); D. Linawianum (*c-h*, *pi-l* and *r*); D. nobile (*c-h*, *w*, *pi*, and *r*, *sc*); D. Pierardii (*c-h*, *c-w* or *pi*, *y*, and *p*); D. primulinum (*c-h*, *pi-w* and *b*); Gesnera exoniensis (*st*, *o-r*); G. pyramidalis (*st*, *o-r* and *r*); Goodyera discolor (*c-h*, *w* and *g-y*); Grammatophyllum speciosum (*st*, *o-y*, *p*, and *r*; 10); Gymnostachyum ceylanicum (*st*, *w*, *g*, and *y*); Gynura aurantiaca (*st*, *o*; 2-3); Hæmanthus natalensis (*ch*, *g*, bracts *p*); Hymenocallis macrostephana (*st*, *w*, *sc*; 2); Imantophyllum cyrtanthiflorum (*c-h*, *pi* or *y*); I. Gardeni (*c-h*, *r-o* or *y*); Impatiens Hookeriana (*st*, *w* and *r*; 2½); I. Sultani (*st*, *r*; 1); I. Walkeri (*st*, *r*; 1-1½); Ipomœa Horsfalliæ (*st*, *pi*); Lælia Dormaniana (*i-h*, *g*, *p*, and *p-w*); L. harpophylla (*i-h*, *o-r* and *w*); L. superbiens (*i-h*, *pi*, *r*, and *y*); Lycaste aromatica (*i-h*, *y*); L. Deppei (*i-h*, *y*, *br*, *w*, and *r*); L. Skinneri (*i-h*, *w*, *pi-l*, and *r*); Masdevallia coccinea (*c-h*, *y* and *r*); M. Lindeni (*c-h*, *w*, *pi*, and *m*); M. tovarensis (*c-h*, *w*); M. Veitchiana (*c-h*, *y*, *o-r*, and *p*); Maxillaria luteo-grandiflora (*i-h*, *c-w*, *br-r*, and *o*); M. venusta (*i-h*, *w*, *y*, and *r*); Nymphæa Devoniensis (*st aq*, *pi-r*); Odontoglossum crispum (*c-h*, *w*, *y*, and *r-br*); O. grande (*c-h*, *o-y*, *c-w*, and *br*); O. Insleayi (*i-h*, *y*, *br*, &c.); O. luteo-purpureum (*c-h*, *br* or *p*, *w*, and *y*); O. odoratum (*c-h*, *y*, *br*, and *p*, *sc*); O. Rossii (*c-h*, *w*, *br*, and *y*); O. R. Ehrenbergii (*c-h*, *w* and *br*); O. R. Warnerianum (*c-h*, *w*, *br*, *y*, &c.); Oncidium bicallosum (*i-h*, *br* and *y*); O. bifolium (*st*, *g-br* and *y*); O. Cavendishianum (*st*, *y*); O. crispum (*i-h*, *br* and *y*); O. cruciatum (*i-h*, *y*, *r*, and *w*); O. cucullatum (*c-h*, *br-p* and *pi-p*); O. incurvum (*c-h*, *w*, *l*, and *br*, *sc*); O. leucochilum (*i-h*, *g*, *br* or *r*, and *w* or *y*); O. ornithorhynchum (*c-h*, *pi-p*, *sc*); O. o. albiflorum (*c-h*, *w*);

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O. tigrinum (*i-h*, *br* and *y*, *sc*); Peristrophe speciosa (*st*, *p*; 4); Phaius grandifolius (*st*, *br*, *w*, and *r-br*; 3); Phalænopsis Aphrodite (*st*, *w*, *r*, *o*, and *y*); Pterostylis Baptistii (*c-h*, *g*, *w*, and *br*; 1); Rivina humilis (*st*, *w-pi*; 1-2); R. lævis (*st*, *w-pi*; 7-8); Ruellia Portellæ (*i-h*, *pi*; 1); Saccolabium giganteum (*st*, *w* and *m-v*, *sc*); S. violaceum (*st*, *w* and *m*) and var.; Sophronitis grandiflora (*c-h*, *r*); S. violacea (*c-h*, *v*; ¼); Stelis ciliaris (*st*, *p*; ½); Talauma pumila (*st*, *c*, *sc*; 2-4); Thunbergia erecta (*st*, *b*, *o*, and *y*; 6) and var.; Tillandsia umbellata (*st*, *b*, *w*, and *g*; 1); Trichopilia fragrans (*c-h*, *y-g*, *w*, spotted *o*, *sc*); Zygopetalum brachypetalum (*i-h*, *br*, *w*, &c.); Z. candidum (*i-h*, *w* and *pi-p*; ¾); Z. crinitum (*c-h*, *g*, *br*, *w*, and *y*); Z. Dayanum (*st*, *w*, *p-v*, and *r*) and vars.; Z. Gairianum (*st*, *v*, *p*, and *o*); Z. Gautieri (*c-h*, *g*, *br*, and *p-b*); Z. Klabochorum (*i-h*, *p*, *w*, and *y*); Z. Mackayi (*c-h*, *p*, *g*, *w*, and *b*); Z. maxillare (*c-h*, *br*, *b*, *p*, and *g*); Z. rostratum (*st*, *w*, *g*, *br-p*, &c.); Z. Sedeni (*i-h*, *p-br*, *g*, and *b-p*); Z. triumphans (*i-h*, *w* and *b*); Z. Wallisii (*c-h*, *w* and *v*).

Shrubs.—Abutilon insigne (*c-h*, *p-r*; 6); A. megapotamicum (*c-h*, *r*, *y*, and *br*; 3); Acacia grandis (*c-h*, *y*; 6); A. viscidula (*c-h*, *y*; 6); Adenocalymna nitidum (*st*, *y*; 10); Barosma pulchella (*c-h*, *r* or *p*; 1-3); Begonia incarnata (*st*, *pi*; 2); B. Lindleyana (*st*, *w*; 3); B. Lynchiana (*st*, *r*); B. nitida (*st*, *pi*; 4-5); B. prestoniensis (*st*, *o-r*; 2); Boronia pinnata (*c-h*, *pi*, *sc*; 1-3); Bouvardia jasmineflora (*c-h*, *w*, *sc*; 2); Brunfelsia eximia (*st*, *p*, *sc*; 2½); Chiococca racemosa (*st*, *w*, becoming *y* and *sc*; 4-6); Clematis grandiflora (*st*, *g-y*; 12); Columnea Kalbreyeriana (*st*, *y* and *r*); Combretum racemosum (*st*, *w*); Crassula lactea (*c-h*, *w*; 1-2) and var.; Daphne odora Mazeli (*c-h*, *w* and *pi*, *sc*); Dianthera ciliata (*st*, *v* and *w*; 2); Diosma ericoides (*c-h*, *w* and *r*; 1-3); Enkianthus quinqueflorus (*c-h*, *r* and *pi-w*; 3-10); Epacris purpurascens (*c-h*, *w* and *r*; 2-3); Erica hyemalis (*c-h*, *pi* and *w*; 2); E. Linnæana (*c-h*, *w* and *r*; 1½); Eupatorium atrorubens (*c-h*, *r* and *l*); E. ianthinum (*c-h*, *p*; 3); E. Weinmannianum (*c-h*, *w*, *sc*); Gardenia Thunbergia (*c-h*, *w*, *sc*; 4-5); Heinsia jasminiflora (*st*, *w*; 5-8); Hibiscus marmoratus (*c-h*, *w* and *pi*); Jasminum gracillimum (*st*, *w*, *sc*); J. Sambac (*st*, *w*, *sc*); Leonotis Leonurus (*c-h*, *r*; 3-6); Leucopogon australis, (*c-h*, *w*; 2-4); L. Richei (*c-h*, *w*; 3-4); Libonia floribunda (*i-h*, *r* and *y*); L. Penrhosiensis (*i-h*, *r*); Mimulus glutinosus, (*c-h*, *br* or *pi*; 5); Monochætum Hartwegianum (*c-h*, *pi*); Mussænda luteola (*c-h*, *y* and *o*; 5-6); Pentas carnea (*st*, *pi-w*; 1½); Plagianthus Lampenii (*c-h*, *y*; 6-8); Pleroma macranthum (*st*, *v-p*); Rhododendron javanicum (*c-h*, *o* and *r*; 4); Ruellia Baikiei (*i-h*, *r*; 3); Stachytarpheta mutabilis (*st*, *r*; 3); Thyrsacanthus rutilans (*st*, *r*; 2); T. Schomburgkianus (*st*, *r*; 2); Whitfieldia lateritia (*st*, *r* and *o*; 3).

MARCH.—Hardy.—Annuals.—Hutchinsia petræa (*w*; ¼); Iberis umbellata (variable; ½-1); Limnanthes Douglasii (*y* and *w*, *sc*; ¾); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Moricandia sonchifolia (*v-b*; 1-2); Nemophila insignis (*b*; 1½); Sonchus Jacquini (*o-y*; 1-2).

Biennials.—Althæa caribæa (*pi*; 3); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Scrophularia chrysantha (*o-y*; ½-1½).

Perennials.—Achillea Clavennæ (*w*; ¾); Adonis vernalis (*y*; ¾-1); Androsace Laggeri (*pi*; ¼); Anemone nemorosa (*w*; ½) and vars.; A. ranunculoides (*y* or *p*; ¼); Antirrhinum majus (2); Aquilegia glandulosa (*l-b*; ¾-1); Arabis albida (*w*; ½-¾); A. alpina (*w*; ½); A. blepharophylla (*pi-p*; ¼); Arenaria balearica (*w*; ¼); Arisæma ringens (*g*, striped *w*); Arum italicum (*g-y* or *w*; ¾-2); Aubrietia deltoidea (*p*; ¼) and var.; Bulbine caulescens (*y*; 2); Bulbocodium vernum (*v-p*; ¼-½); Caltha palustris (*o-y*; 1); Cardamine chelidonia (*p*; 1); C. pratensis (*p* or *w*; 1-1½) and vars.; C. rhomboidea (*w*) and vars.; C. trifolia (*w*; ½); Cheiranthus Cheiri (variable; 1-2); C. Marshalli (*o*; 1-1½); Chionodoxa Luciliæ (*b* and *w*; ½); C. nana (*w* or *l*; ¼); Claytonia sibirica (*pi*; ¼); C. virginica (*w*; ¼); Colchicum luteum (*y*; ¼); C. montanum (*l-p* or *w*; ¼); Convallaria majalis (*w*, *sc*; ½-1); Corydalis cava (*p*; ½) and var.; Crocus aureus (*o*); C. biflorus (*w* to lavender, *p*, and *y*); C. Imperati (*l-p*, *sc*; ¼-½); C. vernus (*l*, *v*, or *w*); C. versicolor (variable); C. varieties; Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Doronicum austriacum (*y*; 1-1½); D. caucasicum (*y*; 1); D. Pardalianches (*y*; 1½-3); D. plantagineum excelsum (*y*; 5); Draba azoides (*y*; ¼); D. Mawii (*w*); Epimedium macranthum (*w*; 10-15); Eranthis hyemalis (*y*; ¼-¾); E. sibiricus (*y*; ¼); Erinus alpinus (*p*; ½); Erythronium americanum (*y*; ¼-½); E. dens-canis (*p-pi* or *w*; ½); Fritillaria græca (*br*; ½); F. tulipifolia (*b* and *br-p*); Gagea lutea (*y*; ½); Galanthus nivalis (*w*; ¼-½); G. plicatus (*w-g*; ½); Gentiana acaulis (*b* and *y*; ¼); Geum montanum (*y*; ½-1); Hacquetia Epipactis (*y*; ¼-½); Helleborus olympicus (*p*; 2); Hyacinthus amethystinus (*b*; ¼-1); H. varieties; Iris reticulata (*v-p* and *y*); I. rubro-marginata (*g*, *p*, and *r*; ¼); Isopyrum thalictroides (*w*; ¾-1¼); Leucoium vernum (*w* and *g*, *sc*; ¼-½); Linaria Cymbalaria (*b* or *l*); Lychnis alpina (*pi*; ½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. Lagascæ (*pi* and *w*; ¼); Mertensia alpina (*b*; ½-¾); M. virginica (*p-b*; 1-2); Muscari botryoides (*b*; ½-1); M. Heldreichii (*b*; ½-¾); M. moschatum (*p*, becoming *g-y* and *v*, *sc*; ¾); M. racemosum (*b*, becoming *r-p*, *sc*; ¼-¾); M. Szovitsianum (*b*, *sc*); Myosotis dissitiflora (*b*; ½-1); M. palustris (*b*; ½-1); M. sylvatica (*b*; 1-2); Narcissus incomparabilis (*y* and *o-y*); N. Pseudo-Narcissus (*g-y* and *o-y*); N. Tazetta (*y* and *w*); Œnothera speciosa (*w*, turning *r*; 2-3); Omphalodes verna (*b* and *w*; ½); Ornithogalum narbonense (*w* and *g*; 1-1½); Oxalis Acetosella (*w* and *p*; ¼); O. corniculata (*y*); Pæonia Emodi (*w*; 2-3); Phlox divaricata (*l* or *b*; ¾-1¼); P. ovata (*r-p*; 1-1½); P. repens (*p* or *v*; ¼); Physochlaina physaloides (*p-v*; 1-1½); Primula altaica (*m* and *y*; ¼-½); P. Auricula vars. (¼); P. Boveana (*y*; ½); P. denticulata (*l*; ¾-1) and var.; P. involucrata (*c*, *w*, and *y*; ½) and var.; P. japonica vars. (1-1½); P. nivalis (*w*; ¼-¾); P. obconica (*l* or *p*; ½-1); P. Parryi (*p* and *y*; ½-1½); P. rosea (*pi* and *y*; ¼); P. sinensis (*w* or *l*; ¾); P. verticillata sinensis (*y*; 1-1½); P. viscosa pedemontana (*pi-p* and *y-w*; ¼); P. vulgaris (*y*; ¼) and var.; Pulmonaria angustifolia (*pi*, turning *b*; 1); Puschkinia scilloides (*w*, striped *b*; ¼-¾); Romulea Bulbocodium (*y* and *v*; ½); Saxifraga Burseriana (*c*); S. crassifolia (*r*; 1); S. ligulata (*r-w*; 1); S. Stracheyi (*pi*; ¼-¾); Scilla amœna (*b* or *w*; ½); S. bifolia (*b*, *r*, or *w*; ¼-½); Sedum acre aureum (*y*); Spiræa prunifolia flore-pleno (*w*; 3); Thalictrum anemonoides (*w* or *pi*; ½); Tradescantia virginica (*v*, *p*, or *w*; ½-2); Tulipa suaveolens (*r* and *y*; ½); Uvularia grandiflora (*y*); U. sessilifolia (*y*; 1); Viola cucullata (*v-b*, *p*, or *w*; ¼-¾); V. Munbyana (*v* or *y*).

March (Hardy Perennials)—*continued.*

Shrubs.—Abelia floribunda (*pi-p*; 3); Abutilon striatum (*o-y*; 10); Akebia quinata (*p-br*; 10); Amygdalus communis (*w* or *pi*; 10-30); A. nana (*pi*; 2-3); Azalea ledifolia (*w*; 2-6); Berberis Aquifolium (*y*; 3-6); B. buxifolia (*y*; 8); B. canadensis (*y*; 4); B. repens (*y*; 1-2); B. vulgaris (*y*; 8-20); B. Wallichiana (*y*; 6-10); Cassiope tetragona (*w*; ½-¾); Clematis cirrhosa (*w* or *c*; 12); Comptonia asplenifolia (*w*; 3-4); Cratægus Oxyacantha (*w*, sometimes *pi*, *sc*; 10-20) and vars.; Daphne Laureola (*y-g*; 3-4); D. Mezereum (*r*; 3-4); Diervilla rosea (*pi* or *w*; 6); Dirca palustris (*y*; 2-5); Erica carnea (*r*; ½); Forsythia viridissima (*y*; 10); Garrya elliptica (*g-w* or *y*; 8-10); Halesia tetraptera (*w*; 15-20); Helianthemum vulgare (*y*); Iberis saxatilis (*w*; ¼-½); I. sempervirens (*w*; ¾-1); Kalmia glauca (*l-p*; 1-2); Kerria japonica (*o-y*; 3-4); Magnolia parviflora (*w* and *pi*); Oxycoccus macrocarpus (*pi*); Piptanthus nepalensis (*y*; 10); Prunus Pissardii (*w*); P. sinensis (*w* or *pi*); P. triloba (*w* or *pi*; 6); Rhododendron dahuricum (*pi*; 3); R. Metternichii (*pi*); Rhodotypos kerrioides (*w*; 15); Ribes floridum (*w*; 4); R. gracile (*w*; 5-6); R. sanguineum (*pi*; 4-8); R. speciosum (*r*; 6-8); Rosa indica (*r*; 4-20);

March (Hardy Shrubs)—*continued.*

Skimmia japonica (*w, sc*; 3-4); S. Laureola (*y, sc*; 3-4); Styrax grandifolia (*w*; 6); Viburnum Tinus (*w* or *pi*; 8-10).

Half-hardy. — ANNUAL. —Zaluzianskia capensis (*w*; ½-1).

PERENNIALS.—Chionographis japonica (*w*; ½-1); Dianella lævis (*b*; 2); Ferraria Ferrariola (*g-br*); F. undulata (*g-br*); Viola pedunculata (*y*).

SHRUBS.—Calceolaria fuchsiæfolia (*y*; 1-2); Cheiranthus mutabilis (*c*, turning *p*; 2-3); Grindelia glutinosa (*y*; 2); Iberis gibraltarica (*w*, and *pi* or *r*; 1-2); Mathiola bicornis (*p-r*); Pernettya furens (*w*); Pittosporum Tobira (*w, sc*; 12); P. undulatum (*w*; 10); Stachyurus præcox (*y-g*; 10).

Tender.—ANNUAL.—Oxalis Barrelieri (*c-h, y*; ¾-1).

PERENNIALS.—Alströmeria caryophyllæa (*st, r, sc*; ¾-1); Amomum Granum Paradisi (*st, w*, tinged *y* or *pi*; 3); Anthurium acaule (*st, b, sc*; 1-3); Arisæma nepenthoides (*c-h, y, br*, and *g*; 2); Begonia herbacea (*i-h, w*; ¼); B. laciniata (*i-h, w*, tinted *pi*); Billbergia Baraquiniana (*st, g* and *r*; 1½); B. iridifolia (*st, r* and *y*, tipped *b*; 1½); B. zebrina (*st, g* and *pi*; 1½); Brassavola glauca (*i-h, y, o*, and *w*; 1); Brassia maculata (*i-h, y*, spotted *br* and *p*; 1); Bromelia bicolor (*st, r*); Callipsyche eucrosiodes (*c-h, r* and *g*; 2); Camellia japonica (*c-h*, variable; 20) and vars.; Canarina Campanula (*c-h, y-p* or *o*; 3-4); Catasetum saccatum (*st, p, y*, and *r*); Cattleya amethystoglossa (*i-h, pi-l, p*, &c.; 2-3); Cineraria cruenta (*c-h, r-p*; 2) and vars.; Cirrhopetalum auratum (*st*, straw, striped *r* and *g*); Clianthus Dampieri (*c-h, r*, blotched *bk* or *p*; 2); Cœlogyne cristata (*i-h, w* and *y, sc*; ¾); C. flaccida (*i-h, w, y*, and *r, sc*; 1); C. Gowerii (*i-h, w* and *g-y*); C. ocellata (*i-h, w, y*, and *br*; 1); C. speciosa (*i-h, w, br* or *g, y*, and *r*; 1½); Crinum Moorei (*c-h, g* and *r*); C. zeylanicum (*st, g* and *r, sc*); Cyanotis Kewensis (*st, pi*); Cyclamen Coum (*c-h, r*; ¼); C. ibericum (*c-h, r*; ¼); C. persicum (*c-h, w* and *p*; ½); C. repandum (*c-h, pi-r*); Cymbidium giganteum (*st, br, y*, and *p*); C. Lowianum (*st, g, br, w-y*, and *p*); Cypripedium Argus (*st, w, pi, g, bk-p*, and *p-br*; 1); C. barbatum (*st, p* and *w*; 1) and vars.; C. lævigatum (*st, p, br, g*, and *y*); C. superbiens (*st, w* and *br*); Cyrtochilum maculatum (*st, g* and *p*); Cyrtopodium Andersoni (*st, y*); Dendrobium Ainsworthii (*st, w, pi*, and *p, sc*); D. Boxallii (*st, w, p*, and *y*); D. Brymerianum (*st, y*); D. crassinode (*st, w, p*, and *o*) and vars.; D. Devonianum (*st, w, p*, and *o*) and vars.; D. fimbriatum (*st, o*); D. Jenkinsii (*c-h*, buff and *y*); D. luteolum (*c-h, y, o*, and *r*); D. nobile (*c-h, w, pi*, and *r, sc*); D. primulinum (*i-h, pi-w* and *b*); D. pulchellum (*i-h, pi-w, pi*, and *o*); D. scabrilingue (*st, w, g, y*, and *o, sc*); D. superbum anosmum (*st, pi* and *p*); D. transparens (*st, w, p-pi, r*, and *y*); Elisena longipetala (*c-h, w*; 3); Epidendrum aurantiacum (*st, o* and *r*; 1); Eurycles amboinensis (*st, w*; 1-2); Griffinia dryades (*i-h, p-l* and *w*; 1½); G. hyacinthina (*i-h, b* and *w*); G. ornata (*i-h, b-l*; 1-1½); Hymenocallis calathinum (*c-h, w, sc*); Imantophyllum cyrtanthiflorum (*c-h, pi* or *y*); I. miniatum (*c-h, o*; 1-2); Impatiens Sultani (*st, r*; 1); Kennedya prostrata (*c-h, r*); K. p. Marryattæ (*c-h, r*); Lachenalia tricolor (*c-h, g, r*, and *y*; 1); Lælia cinnabarina (*i-h, o-r*); L. flammea (*i-h, o-r* and *p-r*); L. harpophylla (*i-h, o-r* and *w*); Lycaste aromatica (*i-h, y*); L. Deppei (*i-h, y, br, w*, and *r*); L. Skinneri (*i-h, w, pi-l*, and *r*); Masdevallia Lindeni (*c-h, w, pi*, and *m*); Maxillaria luteo-grandiflora (*i-h, c-w, br-r*, and *o*); Nymphæa Devoniensis (*st aq, pi-r*); Odontoglossum Cervantesii (*i-h, pi-l, w*, and *r-br*); O. crispum (*c-h, w, y*, and *r-br*); O. luteo-purpureum (*c-h, br* or *p, w*, and *y*); O. maculatum (*c-h, y, br-r*, and *br*); O. odoratum (*c-h, y, br*, and *p, sc*); O. Pescatorei (*c-h, w, p-r*, and *y*); O. pulchellum (*i-h, w* and *p, sc*); O. triumphans (*c-h, y, br-r, pi*, and *w*); Oncidium ampliatum (*st, y*); O. cucullatum (*c-h, br-p* and *pi-p*); O. macranthum (*i-h, y* and *p-br*); O. sarcodes (*i-h, o-y* and *r*); Oxalis rosea (*c-h, pi*; ½-1); O. versicolor (*c-h, w* and *r*; ¼); Phaius grandifolius (*st, br, w*, and *r-br*; 3); P. tuberculosus (*st, w, y*, and *br*); P. Wallichii (*st, o-y, p*, and *br*; 4-5); Phalænopsis Aphrodite (*st, w, r, o*, and *y*); Pitcairnia corallina (*st, r* and *w*); Ponthieva maculata (*st, br, w*, and *y*; 1); Prepusa Hookeriana (*c-h, y-w*; 1); Ranunculus Lyalli (*c-h, w*; 2-4); Richardia africana (*c-h, w*; 2); Rivina humilis (*st, w-pi*; 1-2); R. lævis (*st, w-pi*; 7-8); Selenipedium Roezlii (*st, g* and *pi-p*; 3); Sobralia dichotoma (*st, w, v*, &c.; 6-20); Sonchus Jacquini (*c-h, o-y*; 1-2); Strelitzia augusta (*i-h, w*; 10); Streptanthera elegans (*c-h, pi-w, p*, &c.; ¾); Talauma pumila (*st, c, sc*; 2-4); Theropogon pallidus (*c-h, w*); Thunbergia coccinea (*st*, varying from *r* to *o-pi*); T. erecta (*st, b, o*, and *y*; 6) and var.; Tigridia Meleagris (*c-h, p* and *r*; 1½); T. Van Houttei (*c-h, y, p*, and *l*; 1); Trichopilia suavis (*c-h, w* or *c-w*, and *y*, spotted *v-pi, sc*); Utricularia Endresii (*c-h, l* and *y*; ¼-1); Vanda cærulescens Boxallii (*st, w, v, l*, and *b*); Vinca rosea (*i-h, pi* or *w*).

SHRUBS.—Acacia Catechu (*c-h, y*; 20-40); A. grandis (*c-h, y*; 6); A. longiflora (*c-h, y*; 10); A. platyptera (*c-h, y*; 6-10); Acrotriche ovalifolia (*c-h, w*; ½-1); Andersonia sprengelioides (*st, pi*; 1-3); Anthyllis Barba-Jovis (*c-h, y*; 4-8); Aphelexis fasciculata (*c-h, p*; 2); Aristolochia caudata (*st*, lurid; 5); Athanasia capitata (*st, y*; 1½); Barleria Mackenii (*st, p*); Barosma serratifolia (*c-h, w*; 1-3); Begonia crinita (*st, pi*; 1); B. nitida (*st, pi*; 4-5); B. opuliflora (*st, w*; 1); P. ramentacea (*st, pi* and *w*; 1); B. sanguinea (*st, w*); Boronia Drummondi (*c-h, pi*; 2); B. pinnata (*c-h, pi, sc*; 1-3); Bossiæa disticha (*c-h, y-r*; 1½); Bougainvillea speciosa (*c-h, l*); Bouvardia flava (*c-h, y*; 1½); Brachysema undulatum (*c-h, v-r*); Brillantaisia owariensis (*st, v-b*; 3); Brunfelsia eximia (*st, p, sc*; 2½); Burchellia capensis (*st, r*; 3-4); Calliandra Tweediei (*st, r*; 6); Cantua pyrifolia (*c-h, y-w*; 3); Cereus flagelliformis (*c-h, r* or *pi*); Cestrum fasciculatum (*c-h, p-r*; 5); Clematis grandiflora (*st, g-y*; 12); Combretum racemosum (*st, w*); Correa cardinalis (*c-h, r* and *g*; 3); Daphne odora (*c-h, p, sc*; 3); D. o. Mazeli (*c-h, w* and *pi, sc*); Diosma ericoides (*c-h, w* and *r*; 1-3); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Epacris impressa (*c-h, w*, varying to *r*; 2-3); E. purpurascens (*c-h, w* and *r*; 2-3); E. varieties; Eranthemum aspersum (*st, w* and *p*); Erica andromedæflora (*c-h, r* or *r-p*; 1-3); E. echiiflora (*c-h, r*; 1½); E. gracilis vernalis (*c-h, p-r*; 2-3); E. hyemalis (*c-h, pi* and *w*; 2); E. Linnæana (*c-h, w* and *r*; 1½); E. physodes (*c-h, w*; 1-2); Eriostemon myoporoides (*c-h, pi*; 1-2); E. scaber (*c-h, w* and *pi*; 1½); Eupatorium riparium (*c-h, w*); Fuchsia penduliflora (*c-h, r*); Gardenia Thunbergia (*c-h, w, sc*; 4-5); Gastrolobium bilobum (*c-h, y*); Gnidia pinifolia (*c-h, c-w*; 1); Gompholobium polymorphum (*c-h, r, y*, and *p*); Grevillea fasciculata (*c-h, r* and *y*); G. lavandulacea (*c-h, pi*); G. Thelemanniana (*c-h, r* and *y*; 3-5); Hibbertia dentata (*c-h, y*); Hoya Cumingiana (*st, g-y* or *w*, and *p-br*); Hypericum balearicum (*c-h, y*; 1-2); Indigofera australis (*c-h, pi*; 3-4); Jasminum Sambac (*st, w, sc*); Leucopogon australis (*c-h, w*; 2-4); L. Richei (*c-h, w*; 3-4); Lonicera sempervirens (*c-h, r* and *y*); Macleania speciosissima (*c-h, r* and *y*); Medinilla amabilis (*st, pi*); Mimulus glutinosus (*c-h, br* or *pi*; 5); Mitriostigma axillare (*st, w, sc*; 5); Monochætum sericeum multiflorum (*c-h, mv*); Monsonia speciosa (*c-h, pi* and *p*; ½); Oxylobium cuneatum obovatum (*c-h, y* or *p*; 2); Passiflora cinnabarina (*st, r*); P. racemosa (*st, r*); Pentas carnea (*st, pi-w*; 1½); Philodendron Simsii (*st, r*); Rhipsalis salicornoides (*c-h, y*); Rhododendron javanicum (*c-h, o* and *r*; 4); Solandra grandiflora (*st, g-w*; 15); Stachytarpheta mutabilis (*st, r*; 3); Tetratheca hirsuta (*c-h, pi*; ½-1½); Thyrsacanthus rutilans (*st, r*; 2); T. Schomburgkianus (*st, r*; 3); Whitfieldia lateritia (*st, r* and *o*; 3).

APRIL.—Hardy.—ANNUALS.—Androsace coronopifolia (*w*); Bivonæa lutea (*y*; ¼-½); Hutchinsia petræa (*w*; ¼); Iberis umbellata (variable; ½-1); Limnanthes Douglasii (*y* and *w, sc*; ¾); Malcolmia maritima (*l, pi, r*, or *w*; ½-1);

April (Hardy Annuals)—*continued.*

Nemophila insignis (*b*; 1½); Oxalis stricta (*y*; 1½); Ranunculus amplexicaulis (*w*; ¼-¾); R. gramineus (*y*; ½-1).

BIENNIALS.—Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Achillea Clavennæ (*w*; ¾); Alyssum gemonense (*y*; 1); A. saxatile (*y*; 1) and vars.; A. serpyllifolium (*y*; ¼); Anemone apennina (*b*; ½); A. Halleri (*p*; ½); A. Pulsatilla (*v*; ½-1); A. rivularis (*w* and *p*; 1-2); A. stellata (*p*, *pi*, or *w*; ¾); A. sylvestris (*w*; ½-1½); A. vernalis (*w* and *v*; ½); Antirrhinum majus (variable; 2); Apios hyemale (*g-br*; 1); Aplectrum hyemale (*g-br*; 1); Aquilegia canadensis (*r* and *y*; 1-2); A. glandulosa (*l-b*; ¾-1); Arabis albida (*w*; ½-¾); A. alpina (*w*; ½); A. arenosa (*pi*, *w*, or *b*; ½); A. blepharophylla (*pi-p*; ¼); Arenaria balearica (*w*; ¼); Arisæma ringens (*g*, striped *w*); Armeria setacea (*pi*; ¼); Arum italicum (*g-y* or *w*; ¾-2); A. tenuifolium (*w*; 1); Aubrietia deltoidea (*p*; ¼) and vars.; Bellevalia romana (*w*; ½); Bulbine alooides (*y*; 1); Caltha palustris (*o-y*; 1); C. radicans (*y*; ½); Cardamine pratensis (*p* or *w*; 1-1½) and vars.; C. rhomboidea (*w*) and vars.; C. trifolia (*w*; ½); Carpolyza spiralis (*w* and *r*); Cheiranthus Cheiri (variable; 1-2); C. Marshalli (*o*; 1-1½); Chionodoxa Luciliæ (*b* and *w*; ½); C. nana (*w* or *l*; ¼); Colchicum luteum (*y*; ¼); Convallaria majalis (*w*, *sc*; ½-1); Corydalis cava (*p*; ½) and var.; C. Marschalliana (*g-y*; ¾); C. solida (*p*; ½); Crocus aureus (*o*); C. biflorus (*w* to lavender, *pi*, and *y*); C. vernus (*l*, *v*, or *w*); C. versicolor (variable); C. varieties; Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Dodecatheon Meadia (*pi-p*, *w*, or *l*; 1-1¼) and vars.; Doronicum austriacum (*y*; 1-1½); D. caucasicum (*y*; 1); D. Pardalianches (*y*; 1½-3); D. plantagineum excelsum (*y*; 5); Draba Aizoon (*y*; ¼); D. alpina (*y*; ¼); D. Mawii (*w*); Epimedium macranthum (*w*; 10-15); Eranthis sibiricus (*y*; ¼); Erinus alpinus (*p*; ½); Erysimum ochroleucum (*y*); E. pulchellum (*g-y*; 1); Erythronium americanum (*y*; ¼-½); E. dens-canis (*p-pi* or *w*; ½); Fragaria chilensis (*w*; 1) and var.; Fritillaria imperialis (varying from *y* to *r*; 3); F. lutea (*y* and *p*; ½-1); F. macrophylla (*pi*; 3); F. Meleagris (*p*; 1); F. tenella (*y*); Gagea lutea (*y*; ½); Galanthus nivalis (*w*; ¼-½); G. plicatus (*w-g*; ½); Gentiana acaulis (*b* and *y*; ¼); G. pyrenaica (*b*; ¼); G. verna (*b*; ¼); Geum montanum (*y*; ½-1); Haberlea rhodopensis (*l*; ¼-½); Hacquetia Epipactis (*y*; ¼-½); Helleborus olympicus (*p*; 2); Hyacinthus amethystinus (*b*; ¼-1); H. varieties; Iberidella rotundifolia (*pi-l* and *y*, *sc*; ¼-½); Iris balkana (*l-p*; 1); I. biflora (*v-p* and *y*); I. Chamæiris (*y* and *br*; ¼-½); I. cretensis (*l*); I. cristata (*l* and *y*; ½); I. Pseudo-acorus (*y* and *br*; 2-3); I. pumila (*l-p* and *w*; ¼-½); I. rubro-marginata (*g*, *p*, and *r*; ¼); I. susiana (*w*, *l*, and *br-bk*; 1-1½); I. tuberosa (*p* and *g-y*; 1); Isopyrum thalictroides (*w*; ¾-1¼); Leucoium æstivum (*w* and *g*; 1½); L. vernum (*w* and *g*, *sc*; ¼-½); Linaria Cymbalaria (*b* or *l*); Lychnis alpina (*pi*; ½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. Lagascæ (*pi* and *w*; ¼); Mertensia alpina (*b*; ½-¾); M. virginica (*p-b*; 1-2); Muscari botryoides (*b*; ½-1); M. Elwesii (*b*); M. Heldreichii (*b*; ½-¾); M. moschatum (*p*, becoming *g-y* and *v*, *sc*; ¾); M. paradoxum (*b-bk* and *g*, *sc*); M. racemosum (*b*, becoming *r-p*, *sc*; ¼-¾); M. Szovitsianum (*b*, *sc*); Myosotis dissitiflora (*b*; ½-1); M. palustris (*b*; ½-1); M. sylvatica (*b*; 1-2); Narcissus Bulbocodium (*y*); N. incomparabilis (*y* and *o-y*); N. Jonquilla (*y*, *sc*); N. Macleai (*w* and *y*); N. poeticus (*w* and *r*, *sc*); N. triandrus (*w*); N. varieties; Œnothera speciosa (*w*, turning *r*; 2-3); Omphalodes verna (*b* and *w*; ½); Ophrys apifera (*g* and *pi*; 1); Ornithogalum narbonense (*w* and *g*; 1-1½); O. nutans (*w* and *g*); Oxalis Acetosella (*w* and *p*; ¼); O. corniculata (*y*); Pæonia Wittmanniana (*y-w*; 2); Petasites frigida (*w*; ½); Phlox divaricata (*l* or *b*; ¾-1¼); P. ovata (*r-p*; 1-1½); P. repens (*p* or *v*; ¼); P. subulata (*pi* or *w*) and vars.; Physochlaina physaloides (*p-v*; 1-1½); Polemonium reptans (*b* or *w*; ½); Primula Allionii (*m* and *w*); P. altaica (*m* and *y*; ¼-½); P. Auricula vars. (¼); P. capitata (*v-b*; ¼-¾);

April (Hardy Perennials)—*continued.*

P. denticulata (*l*; ¾-1) and vars.; P. involucrata (*c-w* and *y*; ½) and var.; P. japonica (variable; 1-1½); P. marginata (*v-pi*; ¼); P. nivalis (*w*; ¼-¾); P. obconica (*w*; ½-1); P. Parryi (*p* and *y*; ½-1½); P. rosea (*pi* and *y*; ¼); P. sinensis (*w* or *l*; ¾); P. Steinii (*p*); P. verticillata simensis (*y*; 1-1½); P. viscosa pedemontana (*pi-p* and *y-w*; ¼); P. vulgaris (*y*; ¼) and var.; Pulmonaria angustifolia (*pi*, turning *b*; 1); Puschkinia scilloides (*w*, striped *b*; ¼-¾); Romanzoffia sitchensis (*w*; ¼); Sanguinaria canadensis (*w*; ½); S. Burseriana (*c*); S. crassifolia (*w*; 1); S. granulata (*w*; ½-1½); S. ligulata (*r-w*; 1); S. oppositifolia (*p*) and vars.; S. peltata (*w* or *pi*; 1-2); S. virginiensis (*w*; ¼-¾); Scilla nutans (*b*, *p*, *w*, or *pi*) and var.; Scopolia carniolica (*r* and *y*, or *r* and *g*; 1); Sedum acre aureum (*y*); Soldanella alpina (*v*; ¼); S. montana (*p*; ¼); Spiræa prunifolia flore-pleno (*w*; 3); Thalictrum anemonoides (*pi* or *w*; ½); Tiarella cordifolia (*w*; ½-1); Tradescantia virginica (*v*, *p*, or *w*; ½-2); Trillium erythrocarpum (*w*, striped *p*; 1); T. nivale (*w*; 2-4); Tulipa Eichleri (*r* and *y*, blotched *bk*); T. elegans (*r* and *y*); T. Greigi (*r*, blotched *bk*; ¾); T. Oculus-solis (*r* and *y*, blotched *bk*; 1-1½); T. pubescens vars. (*sc*); T. suaveolens (*r* and *y*; ½); T. sylvestris (*y*; 1-2); Uvularia grandiflora (*y*); U. sessilifolia (*y*; 1); Vesicaria utriculata (*y*; 1); Vinca major (*b-p*); V. minor (*b-p*); Viola cucullata (*v-b*, *p*, or *w*; ¼-¾); V. Munbyana (*v* or *y*); V. rothomagensis (*b*, striped *bk*).

SHRUBS.—Abutilon striatum (*o-y*; 10); Adenocarpus frankenioides (*y*; 1-3); Amelanchier canadensis (*w*; 6-8); A. vulgaris (*w*; 3-9); Amygdalus incana (*r*; 2); Arctostaphylos alpina (*w* or *pi-w*); A. Uva-ursi (*pi-w* and *r*); Azalea amœna (*r*; 1); Berberis Aquifolium (*y*; 3-6); B. buxifolia (*y*; 8); B. canadensis (*y*; 4); B. repens (*y*; 1-2); B. vulgaris (*y*; 8-20); B. Wallichiana (*y*; 6-10); Caragana jubata (*w* and *r*; 1-2); C. spinosa (*y*; 4-6); Cassandra angustifolia (*w*; 1-2); C. calyculata (*w*; 1-3); Ceanothus azureus (*b*; 10); Clematis florida (*w*; 10); Comptonia asplenifolia (*w*; 3-4); Cotoneaster buxifolia (*w*; 3-4); C. frigida (*w*; 10); C. microphylla (*w*; 3-4); C. nummularia (*w*; 10-15); C. thymifolia (*pi*; ¾-1); Crataegus Oxyacantha (*w*, sometimes *pi*, *sc*; 10-20) and vars.; Cydonia Maulei (*r*); Daphne Blagayana (*w*, *sc*; 1); D. Cneorum (*pi*, *sc*; 1); D. Mezereum (*r*; 3-4); D. oleoides (*w*; 2); D. pontica (*g-y*, *sc*; 4-5); Deutzia gracilis (*w*; 1-2); Diervilla rosea (*pi* or *w*; 6); Douglasia nivalis (*pi*; ¼); Erica carnea (*r*; ½); Fremontia californica (*y*; 6-10); Garrya elliptica (*g-w* or *y*; 8-10); Halesia tetraptera (*w*; 15-20); Helianthemum vulgare (*y*); Hydrangea hortensis (variable; 2-3); Iberis saxatilis (*w*; ¼-½); I. sempervirens (*w*; ¾-1); Kalmia glauca (*l-p*; 1-2); Kerria japonica (*o-y*; 3-4); Laburnum vulgare (*y*; 20); Lonicera Periclymenum (*r*); L. tatarica (*pi*; 4-6); Magnolia parviflora (*w* and *pi*); Oxycoccus macrocarpus (*pi*); Pieris floribunda (*w*; 2-6); Piptanthus nepalensis (*y*; 10); Prunus Pissardii (*w*); P. sinensis (*w* or *pi*); P. triloba (*w* or *pi*; 6); Pyrus Maulei (*r*); Rhododendron ferrugineum (*r* and *y*; 1); R. Matternichii (*pi*); Ribes aureum (*o-y*; 6-8); R. floridum (*w*; 4); R. gracile (*w*; 4-5); R. sanguineum (*pi*; 4-8); R. speciosum (*r*; 6-8); Rosa indica (*r*; 4-20); Sambucus racemosa (*w*; 10-20); Skimmia Laureola (*y*, *sc*; 3-4); Stuartia virginica (*w*; 8); Styrax grandifolia (*w*; 6); Syringa Emodi (*p* or *w*; 6).

Half-hardy.—ANNUALS.—Abronia umbellata (*pi*; ½-2); Zaluzianskia capensis (*w*; ½-1).

PERENNIALS.—Chionographis japonica (*w*; ½-1); Erodium Reichardi (*w* and *pi*; ¼); Ferraria Ferrariola (*g-br*); F. undulata (*g-br*); Helicodiceros crinitus (*p-br*, 1-1½); Sarracenia Drummondii (*p*) and vars.; S. flava (*y*) and vars.; S. purpurea (*p*; 1); Triteleia uniflora (*l*); Viola pedunculata (*y*).

SHRUBS.—Calceolaria fuchsiæfolia (*y*; 1-2); Ceanothus cuneatus (*b* or *w*; 4); Cistus vaginatus (*pi*; 2); Clematis indivisa (*w* and *c*; 20); Cneorum pulverulentum (*y*; 1-3); Grindelia glutinosa (*y*; 2); Iberis gibraltarica (*w*, and *pi* or *r*; 1-2); Illicium floridanum (*r*; 8); Mathiola bicornis

April (Half-hardy Shrubs)—*continued.*

(*p-r*); Photinia serrulata (*w*; 10-20); Pittosporum crassifolium (*br-p*; 4-10); P. Tobira (*w, sc*; 12); P. undulatum (*w*; 10); Rhododendron campanulatum (*p-l*; 4); R cinnabarinum (*br-r*); R. Dalhousiæ (*w* or *pi-w*; 6-8).

Tender.—ANNUAL.—Oxalis Barrelieri (*c-h, y*; ¾-1).

PERENNIALS.—Aerides mitratum (*st, w* and *v*; 2); Anthurium acaule (*st, b, sc*; 1-3); Arisæma curvatum (*c-h, g*, striped *w*; 4); A. nepenthoides (*c-h, y, br*, and *g*; 2); Arpophyllum giganteum (*c-h, p* and *pi*); Begonia herbacea (*i-h, w*; ¼); B. laciniata (*i-h, w*, tinted *pi*); Billbergia Baraquiniana (*st, g* and *r*; 1½); B. Zebrina (*st, g* and *pi*; 1½); Brassavola glauca (*i-h, y, o*, and *w*; 1); Brassia maculata (*i-h, y*, spotted *br* and *p*; 1); Burlingtonia candida (*st, w*, stained *y*; 1); B. fragrans (*st, w*); Cattleya amethystoglossa (*i-h, pi-l, p*, &c.; 2-3); C. gigas (*i-h, pi, p*, or *r-v*, and *y*) and var.; C. Mendelli (*i-h, w* to *pi* and *m*); C. Skinneri (*i-h, pi-p* and *w*); Chysis bractescens (*st, w*, blotched *y*); Cineraria cruenta (*c-h, r-p*; 2) and vars.; Cirrhopetalum auratum (*st*, straw, striped *r* and *o*); Cœlia macrostachya (*st, r*; 1½); Cœlogyne flaccida (*i-h, w, y*, and *r, sc*; 1); C. Gowerii (*i-h, w* and *g-y*); C. ocellata (*i-h, w, y*, and *br*; 1); C. speciosa (*i-h, w, br*, or *g, y*, and *r*; 1½); Crinum Moorei (*c-h, g* and *r*); Cyanotis Kewensis (*st, pi*); Cyclamen persicum (*c-h, w* and *p*; ½) and vars.; Cymbidium bicolor (*st, p* and *r*); C. canaliculatum (*st, p-br* and *g-w*); C. giganteum (*st, br, y*, and *p*); Cypripedium Argus (*st, w, pi, g, bk-p*, and *p-br*; 1); C. barbatum (*st, p* and *w*; 1) and vars.; C. lævigatum (*st, p, br, g*, and *y*); C. superbiens (*st, w* and *br*); Cyrtochilum citrinum (*st, g*; 1); C. maculatum (*st, g* and *p*); Cyrtopodium Andersoni (*st, y*); C. punctatum (*st, y, br*, and *p*); Darlingtonia californica (*c-h, g*; 1-1½); Dendrobium Brymerianum (*st, y*); D. cariniferum (*c-h, w, y*, and *r*); D. Dalhousianum (*st, y, r*, and *pi*); D. densiflorum (*st, y*, and *o*) and vars.; D. Devonianum (*st, w, p*, and *o*) and vars.; D. fimbriatum (*st, o*); D. Jenkinsii (*c-h*, buff and *y*); D. lutuiflorum (*st, pi-p, w*, and *p*); D. nobile (*c-h, w, pi*, and *r, sc*); D. scabrilingue (*st, w, g, y*, and *o, sc*); D. superbum anosmum (*st, pi* and *p*); Epidendrum aurantiacum (*st, o* and *r*; 1); Griffinia dryades (*i-h, p-l* and *w*; 1½); G. hyacinthina (*i-h, b* and *w*); G. ornata (*i-h, b-l*; 1-1½); Hæmanthus abyssinicus (*st, r*); H. cinnabarinus (*st, r*); Hesperantha radiata (*c-h, w*; ½); Hessea crispa (*c-h, pi*; ¼); Hymenocallis calathinum (*c-h, w, sc*); Hypoxis stellata (*c-h, w* and *b*; ¾); Imantophyllum cyrtanthiflorum (*c-h, pi* or *y*); I. miniatum (*c-h, o*; 1-2); Impatiens Sultani (*st, r*; 1); Ixia capillaris (*c-h, pi-w* or *l*; 1½); I. hybrida (*c-h, w*; 1); I. maculata (*c-h, o*; 1); I. patens (*c-h. pi*; 1); Kennedya prostrata (*c-h, r*); K. p. Marryattæ (*c-h, r*); Lachenalia pendula (*c-h, p, r*, and *y*; ¼-¾); L. purpurco-cærulea (*c-h, p-b*; ½-¾); L. tricolor (*c-h, g, r*, and *y*; 1); Lælia flammea (*i-h, o-r* and *p-r*); L. præstans (*i-h, pi* and *r-p*); Lycaste aromatica (*i-h, y*); L. Deppei (*i-h, y, br, w*, and *r*); L. jugosa (*i-h, c, w*, and *p*); Manulea rubra (*c-h. y*; 1-2); Marica lutea (*i-h, y, r, w*, and *g*; ½); Masdevallia Estradæ (*c-h, p-mv* and *y*); M. Lindeni (*c-h, w, pi*, and *m*); Maxillaria luteo-grandiflora (*i-h, c-w, br-r*, and *o*); Mormodes buccinator (*st, r-br*; 1-1½); Nymphæa Devoniensis (*st, aq, pi-r*); Odontoglossum bictonense (*i-h*, variable); O. Cervantesii (*i-h, pi-l, w*, and *r-br*); O. crispum (*c-h, w, y*, and *r-br*); O. luteo-purpureum (*c-h, br* or *p, w*, and *y*); O. maculatum (*c-h, y, br-r*, and *br*); O. odoratum (*c-h, y, br*, and *p, sc*); O. Pescatorei (*c-h, w, p-r*, and *y*); O. pulchellum (*i-h, w* and *p, sc*); O. triumphans (*c-h, y, br-r, pi*, and *w*); Oncidium ampliatum (*st, y*); O. cucullatum (*c-h, br-p* and *pi-p*); O. macranthum (*i-h, y* and *p-br*); O. sarcodes (*i-h, o-y* and *r*); Oxalis rosea (*c-h, pi*; ½-1); O. versicolor (*c-h, w* and *r*; ¼); Pelargonium pulchellum (*c-h. w* and *r*); Phædranassa rubro-viridis (*st, r* and *g*; 1); Phaius tuberculosus (*st, w, y*, and *br*); P. Wallichii (*st, o-y, p*, and *br*; 4-5); Phalænopsis Aphrodite (*st, w, r, o*, and *y*); Pitcairnia corallina (*st, r* and *w*); Ranunculus Lyalli (*c-h, w*; 2-4); Richardia africana (*c-h, w*; 2); Rivina humilis

April (Tender Perennials)—*continued.*

(*st, w-pi*; 1-2); R. lævis (*st, w-pi*; 7-8); Sanchezia longiflora (*st, p*); Selenipedium caudatum (*st, y, br*, and *r-b*; 1-1½); S. Roezlii (*st, g* and *pi-p*; 3); Sparaxis grandiflora (*c-h, p, w*, or variegated; 1-2); Stenomesson vitellinum (*i-h, y*; 1); Strelitzia Reginæ (*i-h, o* and *p*; 5); Streptanthera elegans (*c-h, pi-w, p*, and *c*; ¾); Talauma pumila (*st, c* and *sc*; 2-4); Theropogon pallidus (*c-h, w*); Thunbergia coccinea (*st, r* varying to *o-pi*); T. erecta (*st, b, o*, and *y*; 6) and var.; Tigridia atrata (*c-h, p, g*, and *br*; 2); T. Meleagris (*c-h, p* and *r*; 1½); T. Van Houttei (*c-h, y, p*, and *l*; 1); Tricophilia crispa (*c-h, p, w*, and *r*); T. suavis (*c-h, w* or *c-w*, and *y*, spotted *v-pi, sc*); Typhonium Brownii (*st, p*); Utricularia Endresii (*c-h, l* and *y*; ¼-1); Vanda cærulescens Boxallii (*st, w, v*, and *l*); Vinca rosea (*i-h, pi* or *w*); Wahlenbergia saxicola (*c-h, l*; ¼-¾).

SHRUBS.—Abutilon Darwini (*c-h, o*; 4); Acacia brachybotrya (*c-h, y*; 8); A. cultriformis (*c-h, y*; 4); A. cuneata (*c-h, y*; 6); A. Drummondi (*c-h, y*; 10); A. grandis *c-h, y*; 6); A. hispidissima (*c-h, w*; 3-6); A. lunata (*c-h, y*; 2-4); A. oxycedrus (*c-h, y*; 6-10); Acrotriche cordata (*c-h, w*; 1); Agapetes buxifolia (*st, r*; 5); Agathosma acuminata (*c-h, v*; 1-2); A. bruniades (*c-h, l* or *w*; 1-2); A. ciliata (*c-h, w*; 1-2); A. erecta (*c-h, v*; 1-2); Anopterus glandulosa (*c-h, pi-w*; 3); Anthocercis albicans (*c-h, w*; 1½-2); Anthyllis Hermanniæ (*c-h, y*; 2-4); Aphelexis ericoides (*c-h, w*; 1); A. humilis (*c-h, pi*; 2); Athrixia capensis (*c-h, r*; 3); Barleria Mackenii (*st, p*); Barosma dioica (*c-h, p*; 1-2); B. serratifolia (*c-h, w*; 1-3); Begonia crinita (*st, pi*; 1); B. nitida (*st, pi*; 4-5); B. opuliflora (*st, w*; 1); B. ramentacea (*st, pi* and *w*; 1); B. sanguinea (*st, w*); Blæria articulata (*st, r*; 1); Boronia Drummondi (*c-h, pi*; 2); B. pinnata (*c-h, pi*; 1-3); Bossiæa disticha (*c-h, y-r*; 1½); B. rhombifolia (*c-h, y* and *r*; 1-3); Bougainvillea speciosa (*c-h, l*); Brachysema latifolium (*c-h; r*); Brunfelsia acuminata (*st, b-v, sc*; 1-2); B. eximia (*st, p, sc*; 2½); B. hydrangeæformis (*st, b-p, sc*; 1-3); Burtonia scabra (*c-h, p*; 2); Calliandra Tweediei (*st, r*; 6); Camellia japonica (*c-h*, variable; 20) and vars.; Cantua buxifolia (*c-h, r*; 4); Celastrus lucidus (*c-h, w*; 1-3); Cestrum fasciculatum (*c-h, p-r*); Chorizema angustifolium (*c-h, o-r*; 1½); C. cordatum (*c-h, r* or *y*; 1); C. Henchmannii (*c-h, r*; 2); Clematis grandiflora (*st, g-y*; 12); Combretum racemosum (*st, w*); Conocarpus erectus (*st, w*; 6-8); Correa pulchella (*c-h, pi*; 6); Crassula jasminea (*c-h, w*, turning *r*); Diosma ericoides (*c-h, w* and *r*; 1-3); Echium fastuosum (*c-h, b*; 2-4); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Eranthemum pulchellum (*st, b*; 2); Erica andromedæflora (*c-h, r* or *r-p*; 1-3); E. Chamissonis (*c-h, pi*; 1½); E. colorans (*c-h, r* varying to *w*; 2); E. echiiflora (*c-h, r*; 1½); E. gracilis vernalis (*c-h, p-r*; 2-3); E. hyemalis (*c-h, pi* and *w*; 2); E. Linnæana (*c-h, w* and *r*; 1½); E. physodes (*c-h, w*; 1-2); E. Savileana (*c-h, r* or *p-r*; 1); Eriostemon buxifolius (*c-h, pi*; 1-2); E. intermedius (*c-h, w* and *pi*; 3); E. myoporoides (*c-h, pi*; 1-2); E. neriifolius (*c-h, pi*; 3); E. scaber (*c-h, w* and *pi*; 1½); Eupatorium riparium (*c-h, w*); Gærtnera racemosa (*st, y* and *pi, sc*); Gastrolobium bilobum (*c-h, y*); Gaultheria fragrantissima (*c-h, w* or *pi*); Gnidia pinifolia (*c-h, c-w*; 1); Gompholobium polymorphum (*c-h, r, y*, and *p*); G. venustum (*c-h, p*; 1-3); Goodia lotifolia (*c-h, y* and *r*; 2-4); Grevillea fasciculata (*c-h, r* and *y*); G. lavandulacea (*c-h, pi*); G. macrostylis (*c-h, r* and *y*; 4-6); G. Thelemanniana (*c-h, r* and *y*; 3-5); Hibbertia dentata (*c-h, y*); Hovea elliptica (*c-h, b*; 2-4); Hoya Cumingiana (*st, g-y* or *w*, and *p-br*); H. globulosa (*st, w-y* or *c*, and *pi*); Hydrangea petiolaris (*c-h, w*); Hypericum balearicum (*c-h, y*; 1-2); Indigofera australis (*c-h, pi*; 3-4); Jasminum Sambac (*st, w, sc*); Leucopogon australis (*c-h, w*; 2-4); L. Richei (*c-h, w*; 3-4); Lonicera sempervirens (*c-h, r* and *y*); Macleania pulchra (*c-h, y* and *r*); M. speciosissima (*c-h, r* and *y*); Magnolia fuscata (*c-h, p, sc*; 2-4); Medinilla amabilis (*st, pi*); Mimulus glutinosus (*c-h, br* or *pi*; 5); Mitriostigma axillare (*st, w, sc*; 5); Monochætum sericeum multiflorum (*c-h, mv*); Monsonia speciosa

April (Tender Shrubs)—*continued.*

(*c-h*, *pi* and *p*; ½); Morinda jasminoides (*st*, *y-br*); Oxylobium obtusifolium (*c-h*, *o*, *y*, and *r*; 1-3); O. trilobatum (*c-h*, *y*; 2); Passiflora alata (*st*, *r*, *p*, and *w*, *sc*); P. racemosa (*st*, *r*); Pentas carnea (*st*, *pi-w*; 1½); P. parviflora (*st*, *r-y*; 2); Philodendron grandifolium (*st*, *g-p* and *w*); Philotheca australis (*st*, *r*; 2); Pimelea suaveolens (*c-h*, *y*; 1-3); Polygala myrtifolia grandiflora (*c-h*, *p*; 4-6); Protea cordata (*c-h*, *p*; ¼-1); P. Scolymus (*c-h*, *p*; 3); Pultenæa obcordata (*c-h*, *y*; 2); P. rosea (*c-h*, *pi*; 2); P. stricta (*c-h*, *y*; 1-3); P. villosa (*c-h*, *y*; 1-3); Rhipsalis salicornoides (*c-h*, *y*); Rhododendron Anthopogon (*c-h*, *y*; 1-1½); R. formosum (*c-h*, *w*, *p*, and *y*; 3-8); R. javanicum (*c-h*, *o* and *r*; 4); Siphocampylos manettiæflorus (*st*, *r* and *y*; 1); Solandra grandiflora (*st*, *g-w*; 15); Stachytarpheta mutabilis (*st*, *r*; 3); Steriphoma cleomoides (*i-h*, *y*; 6); Thyrsacanthus rutilans (*st*, *r*; 2); T. Schomburgkianus (*st*, *r*; 2); Wigandia macrophylla (*i-h*, *l*; 10).

MAY.—Hardy.—Annuals.—Adonis autumnalis (*r*; 1); Anagallis grandiflora (*b* and *r*; ¼); Androsace coronopifolia (*w*); Campanula Erinus (*b-pi* or *w*; ¼-¾); Collinsia grandiflora (*p* and *b*; 1); C. verna (*w* and *b*; 1); Fumaria capreolata (*w* and *p*; 4); Hutchinsia petræa (*w*; ¼); Iberis umbellata (variable; ½-1); Ionopsidium acaule (*l*, or *w* and *v*; ¼); Lasthenia glabrata (*y*; ¾-1½); Limnanthes Douglasii (*y* and *w*, *sc*; ¾); Linaria reticulata (*p*, and *y* or *br*; 2-4); Loasa Pentlandii (*o*; 4); Lunaria annua (*v-l*; 1½-3); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Mathiola annua (variable; 1-2); Nemophila insignis (*b*; 1½); Oxalis stricta (*y*; 1½); Papaver alpinum (*y*; ½); P. bracteatum (*r*; 4); Ranunculus aconitifolius (*w*; ½-2); R. amplexicaulis (*w*; ¼-¾); R. asiaticus (variable; ¾); R. cortusæfolius (*y*; 2); R. gramineus (*y*; ½-1); Silene pendula (*pi-w*).

Biennials. — Anagallis fruticosa (*r*; 2); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Lunaria annua (*v-l*; 1½-3); Stachys germanica (*pi* and *w*; 1-3).

Perennials.—Achillea Clavennæ (*w*; ¾); A. Herbarota (*w*; ½); Actæa alba (*w*; 1-1½); A. spicata (*w* or *b*; 1) and vars.; Adenophora stylosa (*b*; 1-1½); Ajuga australis (*b*; ½); A. genevensis (varying from *b* to *pi* or *w*; ½-1); A. orientalis (*b*; 1-1½); A. pyramidalis (*b* or *p*; ½); A. reptans (*b* or *pi*; ¾); Alyssum gemonense (*y*; 1); A. serpyllifolium (*y*; ¼); Androsace helvetica (*w*); A. sarmentosa (*pi*); A. villosa (*pi* or *pi-w*, *sc*; ¼); A. Vitaliana (*y*; ¼); Anemone alpina (variable; ½) and vars.; A. baldensis (*w*; ½); A. blanda (*b*; ½); A. decapetala (*w*; 1); A. dichotoma (*w*; 1½); A. fulgens (*r* and *bk*; 1); A. narcissiflora (*c*, or *c* and *p*; 1); A. palmata (*y*; ¾); A. pratensis (*p*; ½-1); A. virginiana (*p-g* or *p*; 2); Antennaria dioica (*pi*; ¼) and vars.; Anthericum Liliago (*w*; 1-1½); Antirrhinum Asarina (*r* and *y*; ½); A. majus (variable; 2); Aquilegia alpina (*b*, or *b* and *w*; 1); A. atropurpurea (*p* or *b-v*; 2-3); A. cærulea (*b* and *w*, or *w*; ¾-1); A. californica (*y* and *o-r*; 2-4); A. canadensis (*r* and *y*; 1-2); A. chrysantha (*y* and *p*; 3-4); A. formosa (*r* and *y*; 2-4); A. fragrans (*w* or *p-r*, *sc*; 1½-2); A. glandulosa (*l-b*; ¾-1); Arabis albida (*w*; ½-¾); A. alpina (*w*; ½); A. arenosa (*pi*, *w*, or *b*; ½); A. blepharophylla (*pi-p*; ¼); A. rosea (*pi-p*; 1); Arenaria balearica (*y*; ¼); A. purpurascens (*p*; ½); Arisæma ringens (*g*, striped *w*); Aristolochia Sipho (*y-b*; 15-30); Aristotelia Macqui (*g*; 6); Armeria dianthoides (*pi*; ½); A. juniperifolia (*pi*; ½); A. setacea (*pi*; ¼); Arnebia echioides (*y*, spotted *p*; ¾-1); Arum italicum (*g-y* or *w*; ¾-2); A. proboscideum (*g-p*; ½); Asarum canadense (*br*; 1); Asperula odorata (*w*; ½-1); Asphodelus albus (*w*; 2); Astragalus austriacus (*b* and *p*); Astrantia carniolica (*w*; ½-1); A. major (*pi*; 1-2); Bellevalia syriaca (*w*; 1); Borago laxiflora (*b*); Brodiæa capitata (*v-p*; 1-2); B. multiflora (*b-p*; 1-1½); Bulbine alooides (*y*; ¾); Caltha leptosepala (*w*; 1); C. palustris (*o-y*; 1); C. radicans (*y*; ½); Campanula betonicæfolia (*p-b* and *y*; 1½); C. cæspitosa (*b* or *w*; ½-1); C. garganica (*b*; ½-1); C. glomerata (*b-v* or *w*; 1-2) and vars.; Cardamine asarifolia (*w*; 1-1½); C. rhomboidea (*w*) and vars.; C. trifolia (*w*; ½); Carpolyza spiralis (*w* and *r*); Cedronella cordata (*p*; ¼-½); Cephalanthera ensifolia (*w*; 1-2); C. grandiflora (*w*; 1-2); Cheiranthus Cheiri (variable; 1-2); C. Marshalli (*o*; 1-1½); Chionodoxa Luciliæ (*b* and *w*; ½); C. nana (*w* or *l*; ¼); Chrysogonum virginianum (*y*; ½); Cineraria aurantiaca (*o*); Colchicum luteum (*y*; ¼); Convallaria majalis (*w*, *sc*; ½-1); Cornus canadensis (*p-w*; ½); Corydalis bracteata (*g-y*; ¾); C. cava (*p*; ½) and var.; C. lutea (*y*; 1); C. nobilis (*y* and *g*; ¾); C. solida (*p*; ½); Cypripedium acaule (*g*, *pi*, and *p*); C. arietinum (*g-br*, *r*, and *w*; ½-1); C. candidum (*g-br* and *w*; 1); C. macranthum (*p*; ¾-1); C. pubescens (*y-br* and *y*; 1½-2); Dentaria digitata (*p*; 1½); D. diphylla (*w* and *p*; ½-1); D. polyphylla (*c*; 1); Dicentra eximia (*r-p*; ¾-1½); D. formosa (*r*; ½); D. spectabilis (*pi-r*; ¾-2); Dictamnus albus (*w*; 1-1½); Doronicum austriacum (*y*; 1-1½); D. caucasicum (*y*; 1); D. Pardalianches (*y*; 1½-3); D. plantagineum excelsum (*y*; 5); Draba glacialis (*y*; ½); D. Mawii (*w*); Epimedium macranthum (*w*; 10-15); E. Musschianum (*w*); Erinus alpinus (*p*; ½); Erysimum alpinum (*g-y*, *sc*; ½); E. ochroleucum (*y*); E. pulchellum (*g-y*; 1); Fragaria chilensis (*w*; 1) and var.; Fritillaria lutea (*y* and *p*; ½-1); F. macrophylla (*pi*; 3); F. pudica (*y*; ½-¾); F. recurva (*r*; 2); Funkia ovata (*b-l* or *w*); Gagea lutea (*y*; ½); Gentiana acaulis (*b* and *y*; ¼); G. ornata (*w* and *b*); G. verna (*b*; ¼); Geranium macrorhizon (*r* or *p*; 1); Geum montanum (*y*; ½-1); Gratiola aurea (*o-y*; ¼); G. officinalis (*w* and *p*; 1); Habenaria blephariglottis (*w*); H. cristata (*y*; 1); Hacquetia Epipactis (*y*; ¼-½); Helleborus olympicus (*p*; 2); Heuchera hispida (veined *p*); Hyacinthus amethystinus (*b*; ¼-1); H. varieties (*sc*); Iberis Tenoreana (*p* or *w*; ½); Iris cretensis (*l*); I. cristata (*l* and *y*; ½); I. flavescens (*g-y*, *p-br*, and *o-y*; 2-3); I. florentina (*w*, *g*, *br*, and *y*, *sc*; 2-3); I. germanica (*p*, *w*, *y*, and *br*, *sc*; 2-3); I. graminea (*p* and *y*, *sc*; ¾); I. lutescens (*y* and *p-br*); I. rubro-marginata (*g*, *p*, and *r*; ¼); I. sambucina (*p* and *y*, *sc*; 2); I. sibirica (*l-b* and *v*; 1-2½); I. squalens (*l-p* and *y*; 2-3); I. tuberosa (*p* and *g-y*; 1); I. variegata (*br* and *y*; 1-1½); Isopyrum thalictroides (*w*; ¾-1¼); Lathyrus rotundifolius (*pi*); Leucoium æstivum (*w* and *g*; 1½); L. vernum (*w* and *g*, *sc*; ¼-½); Linaria Cymbalaria (*b* or *l*); Linum narbonense (*b* or *w*; 2); Lupinus nootkatensis (*b*, and *p*, *w*, or *y*; 1-1½); L. ornatus (*b*; 1-2); L. perennis (*b*; 2); L. polyphyllus (*b*; 4); Lychnis alpina (*pi*; ½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. Lagascæ (*pi* and *w*; ¼); Mandragora vernalis (*w* or *b*; 1); Meconopsis cambrica (*y*; 1); Melittis Melissophyllum (*c-w*, and *pi* or *p*; 1-1½); Mertensia alpina (*b*; ½-¾); M. lanceolata (*b*; ½-1); M. sibirica (*p-b*; ½-1½); M. virginica (*p-b*; 1-2); Meum athamanticum (*w*; 1-2); Mitella pentandra (*y*; ½); Muscari botryoides (*b*; ½-1); M. Heldreichii (*b*; ½-¾); M. moschatum (*p*, becoming *g-y* and *v*, *sc*; ¾); M. racemosum (*b*, becoming *r-p*, *sc*; ¼-¾); Myosotis palustris (*b*; ½-1); M. sylvatica (*b*; 1-2); Myrrhis odorata (*w*; 2-3); Narcissus biflorus (*w* and *y*); N. Bulbocodium (*y*); N. varieties; Œnothera acaulis (*w*, turning *r*; ½); Œ. speciosa (*w*, turning *r*; 2-3); Omphalodes verna (*b* and *w*; ½); Orchis foliosa (*p*; 1½-2½); O. purpurea (*g*, *p*, and *pi*); Ornithogalum narbonense (*w* and *g*; 1-1½); O. nutans (*w* and *g*); O. umbellatum (*w* and *g*); Orobus flaccidus (*p*; 6); O. pannonicus (variable; 1); O. vernus (*p* and *b*; 1); Ourisia coccinea (*r*; ½-1); Oxalis Acetosella (*w* and *p*; ¼); O. corniculata (*y*); Pæonia albiflora (*w* or *pi*; 2-3); P. Moutan (variable; 5); P. officinalis (*r*; 2-3); Pedicularis flammea (*r*; ½-1); P. verticillata (*pi* or *w*; ½-1); Petasites frigida (*w*; ½); Phlox divaricata (*l* or *b*; ¾-1¼); P. ovata (*r-p*; 1-1½); P. pilosa (*pi*, *p*, or *w*; 1-2); P. repens (*p* or *v*; ½); Polygonatum biflorum (*g*; 1-3); Potentilla Saxifraga (*w*; ¼-½); Primula altaica (*m* and *y*; ½-½); P. Auricula vars. (½); P. calycina (*p*); P. capitata (*v-b*; ½-¾); P. denticulata (*l*; ¾-1) and vars.; P. involucrata (*c-w* and *y*; ½) and var.; P. japonica (variable; 1-1½); P. marginata (*v-p*; ¼); P. mollis (*r* and *p-r*; 1-1½); P. nivalis (*w*; ¼-¾); P. obconica (*w*; ½-1); P.

May (Hardy Perennials)—*continued.*

May (Hardy Perennials)—*continued.*

Parryi (*p* and *y*; 1-1½); P. rosea (*pi* and *y*; ¼); P. sinensis (*w* or *y*; ¼); P. Steinii (*p*); P. verticillata sinensis (*y*; 1-1½); P. viscosa pedemontana (*pi-p* and *y-w*; ¼); P. vulgaris (*y*; ¼) and vars.; Pulmonaria angustifolia (*pi*, turning *b*; 1); Puschkinia scilloides (*w*, striped *b*; ¼-¾); Raymondia pyrenaica (*p* or *w*; ¼); Ruscus Hypophyllum (*g*; 1-1½); Salvia interrupta (*v-p*, *w*, and *r-p*; 3); Sanguinaria canadensis (*w*; ½); Saponaria ocymoides (*r* or *pi*); Saxifraga aretioides (*o-y*; ¼); S. Burseriana (*c*); S. cæsia (*c*; ¼); S. Camposii (*w*; ¼-½); S. Cotyledon (*w*; 1-2); S. crassifolia (*w*; 1); S. granulata (*w*; ¼-1½); S. Hostii (*p-w*; ½-1); S. hypnoides (*w*); S. ligulata (*r-w*; 1); S. Maweana (*w*); S. moschata (*y* or *p*; ¼); S. oppositifolia (*p*) and vars.; S. pygmæa (*y*; ¼); S. retusa (*p*); S. virginiensis (*w*; ¼-¾); Scilla hispanica (*b*, *pi-p*, or *w*; ½-¾); S. nutans (*b*, *p*, *w*, or *pi*) and vars.; S. peruviana (*r* or *w*; ½-1); S. pratensis (*b*); Sedum acre aureum (*y*); Silene alpestris (*w*; ½); S. Hookeri (*pi*); Sisyrinchium filifolium (*w*; ½-¾); S. grandiflorum (*p*; ¾); Smilacina oleracea (*w*; 4); S. stellata (*w*; 1-2); Spiræa prunifolia flore-pleno (*w*; 3); Stachys grandiflora (*p* and *v*; 1); Streptopus roseus (*pi-p*; 1½); Stylophorum diphyllum (*y*; 1-1½); Thalictrum aquilegifolium (*w* and *p*, or *w*; 1-3); Tradescantia virginica (*v*, *p*, or *w*; ½-2); Trifolium uniflorum (*b* and *p*; ¼); Trillium erectum (*p*; 1); T. erythrocarpum (*w*, striped *p*; 1); T. grandiflorum (*w*, turning *pi*; 1-1½); Tulipa Eichleri (*r* and *y*, blotched *bk*); T. Gesneriana (variable; 2); T. macrospeila (*r* and *y-w*, blotched *bk*); T. retroflexa (*y*); T. sylvestris (*y*); Uvularia grandiflora (*y*); U. sessilifolia (*y*; 1); Vesicaria utriculata (*y*; 1); Vinca major (*b-p*); V. minor (*b*); Viola cornuta (*b*); V. Munbyana (*v* or *y*); V. pedata (*b* or *w*); V. rothomagensis (*b*, striped *bk*); V. tricolor (*p*, *w*, or *o-y*; ¼-1½); Xerophyllum asphodeloides (*w*; 1-2); Zephyranthes Atamasco (*w*; ½-1).

SHRUBS.—Abutilon striatum (*o-y*; 10); A. vitifolium (*b*; 30); Acacia albicans (*w*; 5); Adenocarpus intermedius (*y*; 3-4); A. parvifolius (*y*; 3-4); Æthionema grandiflorum (*pi*; 1½); Arctostaphylos nitida (*w*; 4); Atragene alpina (*b*, varying to *w*); A. americana (*p-b*); Azalea arborescens (*r*; 10-20); A. calendulacea (*y*, *r*, *o*, and *r-br*; 2-6); A. pontica (variable; 3-4); A. speciosa (*r* and *o*; 3-4); Berberis Aquifolium (*y*; 3-6); B. buxifolia (*y*; 8); A. canadensis (*y*; 4); A. Darwinii (*o*; 2); D. empetrifolia (*y*; 1½-2); B. repens (*y*; 1-2); B. sinensis (*y*; 3-6); B. vulgaris (*y*; 8-20); B. Wallichiana (*y*; 6-10); Bignonia capreolata (*o*; 20); Buddleia globosa (*o*; 15-20); Calophaca wolgarica (*y*; 2-3); Calycanthus floridus (*p*, *sc*; 4-6); C. glaucus (*p*, *sc*; 4-6); C. lævigatus (*p*, *sc*; 3-6); Ceanothus azureus (*b*; 10); C. dentatus (*b*; 4-6); Celastrus scandens (*y*); Clematis florida (*w*; 10); Cotoneaster buxifolia (*w*; 3-4); C. frigida (*w*; 10); C. microphylla (*w*; 3-4); C. nummularia (*w*; 10-15); C. vulgaris (*r*; 3-5); Cratægus Crus-galli ovalifolia (*w*; 10-20); C. C.-g. pruni folia (*w*; 15-20); C. Douglasii (*w*; 10-15); C. flava (*w*; 10-20); C. heterophylla (*w*; 10-20); C. nigra (*w*; 10-20); C. odoratissima (*w*, *sc*; 10-20); C. orientalis (*w*; 12-20); C. Oxyacantha (*w*, sometimes *pi*, *sc*; 10-20) and vars.; C. Pyracantha (*w*; 10-20); C. tanacetifolia (*w*; 12-20); Cytisus purpureus (*p*); Daphne pontica (*g-y*, *sc*; 4-5); Diervilla rosea (*pi* or *w*; 6); Elæagnus hortensis (*y*, *sc*; 15-20); Empetrum nigrum (*pi*; ½-1); E. n. rubrum (*br-p*; ½-1); Epigæa repens (*w* and *r*, *sc*); Exochorda grandiflora (*w*; 6); Fabiana imbricata (*w*; 3); Fothergilla alnifolia (*w*, *sc*; 3-6); Garrya elliptica (*g-w* or *y*; 8-10); Gaultheria Shallon (*w* and *r*); Halesia tetraptera (*w*; 15-20); Halimodendron argenteum (*p*; 4-6); Helianthemum vulgare (*y*); Hippophae rhamnoides (*y*; 2-20); Hydrangea hortensis (variable; 2-3); Iberis correæfolia (*w*; 1); I. saxatilis (*w*; ¼-½); I. sempervirens (*w*; ¾-1); I. s. Garrexiana (*w*; ½-¾); Kalmia glauca (*l-p*; 1-2); Kerria japonica (*o-y*; 3-4); Laburnum vulgare (*y*; 20); Leucothoë axillaris (*w*; 2-3); L. racemosa (*w*; 4-10); Linnæa borealis (*pi-w*); Lonicera Caprifolium (*y* and *b*, *sc*); L. Periclymenum (*r*); L. tatarica (*pi*; 4-6); Lycium barbarum (*p* and *y*); Magnolia glauca (*w*, *sc*; 15); M. parviflora (*w* and *pi*); Opuntia Engelmanni (*y*; 4-6); O. Ficus-Indica (*y*; 2); O. missouriensis (*y*); Oxycoccus macrocarpus (*pi*); O. palustris (*pi*); Pavia californica (*w* or *pi*; 12-15); P. flava (*y*; 20); Philadelphus coronarius (*w*, *sc*; 2-10); Phillyrea media (*w*; 10-15); Pieris floribunda (*w*; 2-6); Piptanthus nepalensis (*y*; 10); Prunus sinensis (*w* or *pi*); P. triloba (*w* or *pi*; 6); Pyrus arbutifolia (*w* or *p-w*; 2-10); P. Chamæmespilus (*r*; 5-6); P. floribunda (*pi-r*); P. Toringo (*w*, or *pi-w*); Rhododendron ciliatum (*r-p*; 2); R. ferrugineum (*r* and *y*; 1); R. Fortunei (*pi*; 1-2); R. hirsutum (*r*; 1-2); R. Matternichii (*pi*); Rhodothamnus Chamæcistus (*pi*; ½); Ribes aureum (*o-y*; 6-8); R. floridum (*w*; 4); R. gracile (*w*; 4-5); R. sanguineum (*pi*; 4-8); R. speciosum (*r*; 6-8); Robinia hispida (*pi*; 3-8); Rosa blanda (*pi*; 1-3); R. indica (*r*; 4-20); R. lucida (*r*; 1-2) and var.; R. spinosissima (*w* or *pi*; 1-4); Rubus biflorus (*w*); R. spectabilis (*r*; 6-10); Sambucus racemosa (*w*; 10-20); Staphylea pinnata (*w*; 6-12); Stuartia pentagyna (*c*; 10); Styrax grandifolia (*w*; 6); Syringa Josikæa (*b-p*; 5-10); S. vulgaris (*r*, *b*, or *w*; 8-20) and vars.; Viburnum plicatum (*w* or *pi*; 4-6); V. prunifolium (*w* or *pi*); Wistaria chinensis (*b*).

Half-hardy.—ANNUALS.—Schizopetalon Walkeri (*w*; 1-2); Zaluzianskia capensis (*w*; ½-1).

PERENNIALS.—Abronia fragrans (*w*; 1-2); Andryala lanata *y*; 1); Anigozanthus flavidus (*y-g*; 3); A. pulcherrimus (*y*; 3); A. trianthinus (*p* and *w*; 3); Astilbe japonica (*w*; 1-2); Calceolaria Fothergillii (*y*, spotted *r*; ¼-½); Caliphruria Hartwegiana (*g-w*; 1); Chionographis japonica (*w*; ½-1); Erodium Reichardi (*w* and *pi*; ¼); Ferraria Ferrariola (*g-br*); Heteranthera limosa (*aq*, *v-b*); Loasa lateritia (*r*); Lobelia fulgens (*r*; 1-2); L. splendens (*r*; 1-2); Moræa edulis (*v*; 4); M. tricuspis (*g-w*; 1); Neja gracilis (*y*; 1); Nolina georgiana (*w*); Sarracenia flava (*y*) and vars.; S. purpurea (*p*; 1); S. rubra (*r-p*; 1-1½); Tricyrtis hirta (*w*, dotted *p*; 1-3); T. macropoda (*w-p*, dotted *p*; 2-3); Triteleia uniflora (*l*); Viola pedunculata (*y*); Wachendorfia thyrsiflora (*y*; 2); Zephyranthes carinata (*g-pi*; 1); Z. rosea (*pi*; ½).

SHRUBS.—Adenocarpus foliolosus (*y*; 4-6); Calceolaria hyssopifolia (*y*; 1-2); C. scabiosæfolia (*y*); Cistus salvifolius Corbariensis (*w*; 2); C. vaginatus (*pi*; 2); C. villosus canescens (*p*, *b*, and *y*; 2); Clianthus puniceus (*r*; 3); Cneorum pulverulentum (*y*; 1-3); Convolvulus Cneorum (*pi*; 1-3); Coronilla glauca (*y*, *sc* by day; 2-4); Gaylussacia frondosa (*g-p*; 3-6); G. resinosa (*r*; 1-3); Geranium anemonæfolium (*p-r*; 1-2); Grindelia glutinosa (*y*; 2); Hudsonia ericoides (*y*; 1); Illicium floridanum (*r*; 8); Linum arboreum (*y*; 1); Mathiola bicornis (*p-r*); Mitraria coccinea (*r*); Ononis arragonensis (*y*; 1-2); Pernettya pilosa (*w*; ½); Photinia serrulata (*w*; 10-20); Pittosporum undulatum (*w*; 10); Rhododendron cinnabarinum (*br-r*); R. Dalhousiæ (*w* or *pi-w*; 6-8); R. glaucum (*pi-p*; 2); R. lepidotum (*y* or *p*; 2-4); R. Veitchianum (*w*; 6); Statice macrophylla (*w*; 2); S. rosea (*b*; 3); Viburnum odoratissimum (*w* or *pi*, *sc*; 6-10).

Tender.—ANNUAL.—Coccocypselum repens (*st*, *b*).

BIENNIAL.—Echium candicans (*c-h*, *b*; 2-4).

PERENNIALS.—Acineta chrysantha (*c-h*, *y*, *w*, and *r*, *sc*; 1½); A. Humboldtii (*c-h*, *y*, dotted *br*; 2); Acriopsis picta (*st*, *w*, *g*, and *p*; ½); Aerides crispum (*st*, *p-pi* and *w*; 1); Albuca fastigiata (*c-h*, *w*; 1½); Amomum Melegueta (*st*, *pi*; 1-2); Aneilema sinicum (*c-h*, *b*; 1); Anthurium acaule (*st*, *b*, *sc*; 1-3); Arethusa bulbosa (*c-h*, *pi-p*, *sc*; ¾); Arisæma nepenthoides (*c-h*, *y*, *br*, and *g*; 2); Arpophyllum giganteum (*c-h*, *p* and *pi*); Arthropodium neo-caledonicum (*c-h*, *w*; 1½); A. paniculatum (*c-h*, *w*; 3); Arum palæstinum (*c-h*, *bk* and *y-w*, spotted *p*); Babiana plicata (*c-h*, *v-b*, *sc*; ½); B. ringens (*c-h*, *r*; ½-¾); B. stricta (*c-h*, *w* and *l-b*; 1) and vars.; Begonia herbacea (*i-h*, *w*; ¼); B. laciniata

May (Hardy Shrubs)—*continued.*

May (Tender Perennials)—*continued.*

(*i-h, w,* tinted *pi*); Brassia maculata (*i-h, y,* spotted *br* and *p*; 1); B. verrucosa (*i-h, g,* blotched *bk-p* and *w*); Brunsvigia falcata (*c-h, r*; ¾); Burlingtonia candida (*st, w,* stained *y*; 1); Calanthe veratrifolia (*i-h, w*; 2-3); Calochilus paludosus (*c-h, g* and *br*; ¾); Canistrum eburneum (*st, w* and *g*; 2); Caraguata Zahnii (*st, y*; 1); Cattleya amethystoglossa (*i-h, pi-l, p,* and *c*; 2-3); C. citrina (*i-h, y, sc*; ½-¾); C. gigas (*i-h, pi, p,* or *r-v,* and *y*) and var.; C. intermedia (*i-h,* variable; 1); C. Mendelli (*i-h, w* to *pi,* and *m*); C. Mossiæ (*i-h, pi, &c.*; 1) and vars.; C. Skinneri (*i-h, pi-p* and *w*); Ceropegia Barklyi (*c-h, pi*); Chironia jasminoides (*c-h, r* or *p*; 1-2); Chysis aurea (*st, y* and *r*) and vars.; C. bractescens (*st, w,* blotched *y*); Cineraria cruenta (*c-h, r-p*; 2) and vars.; Cirrhæa Loddigesii (*st, g-y* and *r* striped); Cirrhopetalum auratum (*st,* straw, striped *r* and *o*); Clivia nobilis (*c-h, r* and *y*; 1½); Cœlogyne flaccida (*i-h, w, y,* and *r, sc*; 1); C. Gowerii (*i-h, w* and *g-y*); C. Hookeriana (*i-h, pi-p, w, br,* and *y*; ¼); C. speciosa (*i-h, w, br* or *g, y,* and *r*; 1½); Comparettia falcata (*i-h, pi-p*; ½); C. rosea (*i-h, pi-p*; ½); Coryanthes macrantha (*st, y* and *p*); Crinum Moorei (*c-h, g* and *r*); Curcuma rubricaulis (*st, r*; 1); Cyanotis Kewensis (*st, pi*); Cymbideum giganteum (*st, br, y,* and *p*); Cypripedium barbatum (*st, p* and *w*; 1) and vars.; C. Dayanum (*st, w, p,* and *g*); C. lævigatum (*st, p, br, g,* and *y*); D. superbiens (*st, w* and *br*); C. villosum (*st, o-r, g, p,* and *br*; 1); Cyrtochilum maculatum (*st, g* and *p*); Cyrtopodium Andersoni (*st, y*); Dendrobium albo-sanguineum (*st, w* and *r*); D. Bensoniæ (*c-h, w, o,* and *bk*); D. Dalhousianum (*st, y, r,* and *pi*); D. densiflorum (*st, y* and *o*) and vars.; D. erythroxanthum (*st, o* and *p*); D. Falconeri (*st, w, p,* and *o*); D. Farmeri (*st, y* and *pi*); D. infundibulum (*st, w*); D. longicornu majus (*st, w*); D. moniliforme (*c-h, w* and *p*; *sc*); D. scabrilingue (*st, w, g, y,* and *o, sc*); D. superbum anosmum (*st, pi* and *p*); D. Wardianum (*st, w, m, o,* and *r*); Disporum lanuginosa (*c-h, y* and *g*; 1); Epidendrum atropurpureum (*c-h, pi* and *p*; ½-1); E. auran-tiacum (*st, o* and *r*; 1); Episcia villosa (*st, w* and *p*; 1-1½); Fragaria indica (*c-h, y*); Galaxia ovata (*c-h, y*); Geissorhiza grandis (*c-h, y* and *r*); G. inflexa (*c-h, y* and *p*; 1½); G. Rochensis (*c-h, b* and *r*; ¾); Gesnera Cooperi (*st, r*; 2); Gladiolus cuspidatus (*c-h,* variable; 2-3); G. floribundus (*c-h, w* and *p,* varying to *pi-w* and *r*; 1); Gongora maculata (*st, y* and *pi-r*; 1½); Griffinia dryades (*i-h, p-l* and *w*; 1½); G. hyacinthina (*i-h, b* and *w*); G. ornata (*i-h, b-l*; 1-1½); Hedychium coronarium (*st, w, sc*; 5); Hesperantha radiata (*c-h, w*; ½); Hessea crispa (*c-h, pi*; ¼); Hypoxis stellata (*c-h, w* and *b*; ¾); Imantophyllum cyrtanthiflorum (*c-h, pi* or *y*); I. miniatum (*c-h, o*; 1-2); Impatiens Sultani (*st, r*; 1); Ixia hybrida (*c-h, w*; 1); I. maculata (*c-h, o*; 1); I. odorata (*c-h, y, sc*; 1); I. speciosa (*c-h, r*; ½); I. viridiflora (*c-h, g*; 1); Kennedya prostrata (*c-h, r*); K. p. Marryattæ (*c-h, r*); K. rubicunda (*c-h, r*); Lachenalia fragrans (*c-h, r, sc*; ½); L. tricolor (*c-k, g, r,* and *y*; 1); Lælia præstans (*i-h, pi* and *r-p*); L. purpurata (*i-h, w* and *p-r*); L. P. Williamsii (*i-h, pi* and *r*); Lycaste aromatica (*i-h, y*); L. Deppei (*i-h, y, br, w,* and *r*); L. jugosa (*i-h, c, w,* and *p*); Manulea rubra (*c-h, y*; 1-2); Marica cærulea (*st, b, y, br,* and *o*; 2); Maxillaria luteo-grandiflora (*i-h, c-w, br-r,* and *o*); Miltonia Phalænopsis (*i-h, w, p-r,* and *y*; ½); Nerine undulata (*c-h, pi-w*; 1); Nymphæa Devoniensis (*st aq, pi-r*); Odontoglossum citrosmum (*i-h, w* and *p, sc*); O. crispum (*c-h, w, y,* and *r-br*); O. luteo-purpureum (*c-h, br* or *p, w,* and *y*); O. maculatum (*c-h, y, br-r,* and *br*); O. odoratum (*c-h, y, br,* and *p, sc*); O. Pescatorei (*c-h, w, p-r,* and *y*); O. pulchellum (*i-h, w* and *p, sc*); O. triumphans (*c-h, y, br-r, pi,* and *w*); Oncidium ampliatum (*st, y*); O. cucullatum (*c-h, br-p* and *pi-p*); O. macranthum (*i-h, y* and *p-br*); O. sarcodes (*i-h, o-y* and *r*); Oxalis rosea (*c-h, pi*; ½-1); Peperomia clusiæfolia (*st, r*; 1); Phaius tuberculosus (*st, w, y,* and *br*); P. Wallichii (*st, o-y, p,* and *br*; 4-5); Phalænopsis Aphrodite (*st, w, r, o,* and *y*); Pitcairnia corallina (*st, r* and *w*); P. fulgens (*st, r*); P. pungens (*st, r*); Pogonia Gammieana (*st, l*); Pteradiscus speciosus (*st,*

May (Tender Perennials)—*continued.*

r or *l*; 2); Ranunculus Lyalli (*c-h, w*; 2-4); Richardia africana (*c-h, w*; 2); Rivina humilis (*st, w-pi*; 1-2); R. lævis (*st, w-pi*; 7-8); Romulea speciosa (*c-h, pi, y,* and *v*; ½); Saccolabium curvifolium (*st, r*; ½-1); S. rubrum (*st, pi*; ¾); Selenipedium caudatum (*st, y, br,* and *r-br*; 1-1½); S. Lindeni (*st, w*; 1); S. Roezlii (*st, g* and *pi-p*; 3); Sparaxis tricolor (*c-h, y,* spotted *br, &c.*); Spiranthes colorans (*st, r*; 2); Stapelia Asterias (*c-h, v, y,* and *p*; ½); Stenomesson aurantiacum (*i-h, y*; 1); S. coccineum (*i-h, r*; 1); Streptanthera elegans (*c-h, pi-w, p, &c.*; ¾); Streptocarpus Dunnii (*i-h, r-pi*; 1); Stylidium bulbiferum macrocarpum (*c-h, g-p*); Synnotia variegata (*c-h, y* and *v*; 1½); Talauma pumila (*st, c, sc*; 2-4); Theropogon pallidus (*c-h, w*); Thunbergia erecta (*st, b, o,* and *y*; 6) and vars.; Tigridia Meleagris (*c-h, p* and *r*; 1½); T. Van Houttei (*c-h, y, p,* and *l*; 1); Tillandsia xiphioides (*st, w, sc*); Trichopilia crispa (*c-h, p, w,* and *r*); T. marginata (*c-h,* variable); Utricularia Endresii (*c-h, l* and *y*; ¼-1); Vallota purpurea (*c-h, r*; 2-3) and vars.; Vanda cærulescens Boxallii (*st, w, v, l,* and *b*); V. insignis (*st, br, y-w, w,* and *pi*); Vinca rosea (*i-h, pi* or *w*); Vitex Lindeni (*l,* streaked *r*); Watsonia Meriana (*c-h, p* or *r*; ¾-2); Zephyranthes Andersoni (*c-h, o-r*; ¼).

Shrubs.—Acacia affinis (*c-h, y*; 5); A. arabica (*c-h, w*; 20); A. grandis (*c-h, y*; 6); A. heterophylla (*c-h, y*; 5); A. Lebbek (*c-h, y*; 20); A. linearis (*c-h, y*; 3-6); A. Riceana (*c-h, y*; 20); Acæna myriophylla (*c-h, g*; ½-1); Acmena floribunda (*c-h, w*; 4); Acrophyllum venosum (*c-h, pi-w*; 6); Acrotriche divaricata (*c-h, w*; ½-1); Adenandra fragrans (*st, pi*; 1-2); Adesmia glutinosa (*c-h, y*; 1-2); Albizzia lophantha (*c-h, y*; 6-10); Alonsoa incisifolia (*c-h, r*; 1-2); Amerimnon Brownei (*st, w, sc*; 6-10); Anona longifolia (*st, p*; 20); Anopterus glandulosa (*c-h, pi-w*; 3); Anthocercis viscosa (*c-h, w*; 4-6); Aotus gracillima (*c-h, y* and *r*; 3); Apeiba aspera (*st, o*; Astilbe Thunbergi (*c-h, w*; 1½); Azalea sinensis (*c-h, y-r*; 3-4); Backhousia myrtifolia (*c-h, w*; 16); Barleria Mackenii (*st, p*); Barnadesia rosea (*c-h, pi*; 1½); Barosma serratifolia (*c-h, w*; 1-3); Beaufortia purpurea (*c-h, p-r*); Begonia crinita (*st, pi*; 1); B. nitida (*st, pi*; 4-5); B. opuliflora (*st, w*; 1); B. ramentacea (*st, pi* and *w*; 1); B. sanguinea (*st, w*); Bignonia speciosa (*i-h, pi,* stained *p*; 4); Billardiera longiflora (*c-h, g-y,* turning *p*); B. scandens (*c-h, c,* turning *p*; 10); Boronia Drummondi (*c-h, pi*; 2); B. elatior (*c-h, pi*; 4); B. pinnata (*c-h, pi*; 1-3); Bossiæa disticha (*c-h, y-r*; 1½); B. linnæoides (*c-h, y* and *br*); Bougainvillea speciosa (*c-h, l*); Brucea sumatrana (*st, p*; 20); Brunfelsia eximia (*st, p, sc*; 2½); Bunchosia odorata (*c-h, y*; 7); Burtonia villosa (*c-h, p*; 2); Cacoucia coccinea (*st, r*); Camellia japonica (*c-h,* variable; 20) and vars.; Capparis amygdalina (*st, w*; 6); Celastrus lucidus (*c-h, w*; 1-3); Cercocarpus fothergilloides (*c-h, p*; 12); Chorizema diversifolium (*c-h, o-r*; 2); C. Henchmannii (*c-h, r*; 2); Clematis grandiflora (*st, g-y*; 12); Cobæa scandens (*c-h, p*; 20); Comarostaphylis arbutoides (*c-h, w*; 6); Combretum elegans (*st, y*); C. grandiflorum (*st, r*); C. racemosum (*st, w*); Crassula arborescens (*c-h, pi*; 2-3); C. jasminea (*c-h, w,* turning *r*); Decaisnea insignis (*c-h, g*; 8); Dillwynia ericifolia (*c-h, y*); D. hispida (*c-h, p-r*; 3-6); Diosma ericoides (*c-h, w* and *r*; 1-3); Dipladenia amabilis (*st, pi-r*; 10); Echium fastuosum (*c-h, b*; 2-4); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Epacris longiflora (*c-h, r* and *w*; 2-4); E. pulchella (*c-h, r* or *pi*; 1-3); Erica andromedæflora (*c-h, r* or *r-p*; 1-3); E. Cavendishiana (*c-h, y*; 1½); E. cerinthoides (*c-h, r*; 3); E. colorans (*c-h, r,* varying to *w*; 2); E. echiiflora (*c-h, r*; 1½); E. eximia (*c-h, r* and *g*; 2); E. hybrida (*c-h, r*); E. hyemalis (*c-h, pi* and *w*; 2); E. Lambertiana (*c-h, w*; 1-2); E. Linnæana (*c-h, w* and *r*; 1½); E. McNabiana (*c-h, pi-r* and *w*); E. odorata (*c-h, w, sc*; 1); E. physodes (*c-h, w*; 1-2); E. primuloides (*c-h, pi-p*; 1); E. Savileana (*c-h, r* or *p-r*; 1); E. tricolor (*c-h, r, w,* and *g-y*; 2); Eriostemon buxifolius (*c-h, pi*; 1-2); E. scaber (*c-h, w* and *pi*; 1½); Eupatorium riparium (*c-h, w*);

Felicia fruticosus (*c-h,*

May (Tender Shrubs)—*continued.*

p and *y*; 1-2); Gastrolobium bilobum (*c-h*, *y*); Gomphia oliveæformis (*st*, *y*; 10-15); Gompholobium polymorphum (*c-h*, *r*, *y*, and *p*); G. venustum (*c-h*, *p*; 1-3); Goodia lotifolia (*c-h*, *y* and *r*; 2-4); Grevillea alpina (*c-h*, *r* and *y*; 4); G. fasciculata (*c-h*, *r* and *y*); G. lavandulacea (*c-h*, *pi*); G. Thelemanniana (*c-h*, *r* and *y*; 3-5); Heliotropium corymbosum (*c-h*, *l*; 4); Hibbertia dentata (*c-h*, *y*); Hindsia violacea (*st*, *b*; 3); Hovea elliptica (*c-h*, *b*; 2-4); Hoya Cumingiana (*st*, *y-y* or *w*, and *p-br*); Hydrangea petiolaris (*c-h*, *w*); Hypericum balearicum (*c-h*, *y*; 1-2); Indigofera australis (*c-h*, *pi*); 3-4); Jasminum Sambac (*st*, *w*, *sc*); Juanulloa parasitica (*st*, *o*; 3); Lachnæa buxifolia (*c-h*, *w*; 2); Leucopogon Richei (*c-h*, *w*; 3-4); Lonicera sempervirens (*c-h*, *r* and *y*); Lotus peliorhynchus (*c-h*, *r*; 2); Luculia Pinceana (*c-h*, *w*, *sc*); Mackaya bella (*c-h*, *l* and *p*; 6); Medinilla amabilis (*st*, *pi*); M. magnifica (*st*, *pi*; 3); Mesembryanthemum coccineum (*c-h*, *r*); M. spectabile (*c-h*, *r*; 1); Mimulus glutinosus (*c-h*, *br* or *pi*; 5); Mitriostigma axillare (*st*, *w*, *sc*; 5); Monsonia speciosa (*c-h*, *pi* and *p*; ½); Myrtus Ugni (*c-h*, *w*; 4); Opuntia braziliensis (*c-h*, *y-y*; 10-30); Oxylobium ellipticum (*c-h*, *y*; 2-3); Passiflora alata (*st*, *r*, *p*, and *w*; *sc*); P. alba (*st*, *w*); P. amabilis (*st*, *r* and *w*); P. racemosa (*st*, *r*); Pelargonium abrotanifolium (*c-h*, *w* or *pi*; 3); P. quercifolium (*c-h*, *p* or *pi*; 3); Pentas carnea (*st*, *pi-w*; 1½); Petrophila acicularis (*c-h*, *w* and *r*; 2); Philodendron crassinervium (*st*, *r* and *y-y*); Physostelma Waliichii (*st*, *y-y*); Pimelea ferruginea (*c-h*, *pi* or *r*; 1-2); P. hispida (*c-h*, *b*; 2-4); P. spectabilis (*c-h*, *pi-w*; 3-4); Pittosporum viridiflorum (*c-h*, *y-y*, *sc*; 6); Platylobium triangulare (*c-h*, *y*; 1); Pleroma elegans (*st*, *b*; 5); Podalyria calyptrata (*c-h*, *p*; 6); Podanthes geminata (*st*, *o-y* and *r-p*); Polygala myrtifolia grandiflora (*c-h*, *p*; 4-6); Protea formosa (*c-h*, *r*, *pi*, and *w*; 6); Psidium Cattleyanum (*st*, *w*; 10-20); Psoralea pinnata (*c-h*, *b*; 3-6); Pultenæa stricta (*c-h*, *y*; 1-3); Quisqualis indica (*st*, variable); Rhipsalis salicornioides (*c-h*, *y*); Rhododendron Anthopogon (*c-h*, *y*; 1-1½); R. Aucklandii (*c-h*, *w*, *pi*, and *y*; 4-8); R. calophyllum (*c-h*, *y-w*; 3); R. Edgeworthii (*c-h*, *w*, *sc*); R. formosum (*c-h*, *w*, *p*, and *y*; 3-8); R. jasminiflorum (*c-h*, *pi-w*; 2); R. javanicum (*c-h*, *o* and *r*; 4); R. Nuttallii (*c-h*, *w*, *sc*; 12-30); R. Thomsoni (*c-h*, *r*; 6-15); Sida inæqualis (*st*, *w*; 7); Solandra grandiflora (*st*, *y-w*; 15); S. viridiflora (*st*, *y*; 2-3); Sparmannia africana (*c-h*, *w*; 10-20); Sphæralcea miniata (*c-h*, *r*; 1); Sprengelia incarnata (*c-h*, *pi*; 2); S. Poncletia (*c-h*, *r*; 1); Stachytarpheta mutabilis (*st*, *r*; 3); Stenanthera pinifolia (*c-h*, *r-y* and *y*; 2-3); Stephanotis floribunda (*st*, *w*, *sc*; 10); Steriphoma cleomoides (*c-h*, *y*; 6); Thyrsacanthus rutilans (*st*, *r*; 2); T. Schomburgkianus (*st*, *r*; 2); Turnæa obtusifolia (*c-h*, *w*; 4-6); Yucca aloifolia (*c-h*, *w*; 15-20).

JUNE.—Hardy.—ANNUALS.—Acroclinium roseum (*pi*; 1-2) and vars.; Adonis æstivalis (*r*; 1); Æthionema Buxbaumii (*r*; ½); Agrostemma cœli-rosa (*pi*, *w*, or *p*; 1); Anagallis grandiflora (*b* and *r*; ½); Androsace coronopifolia (*w*); Bartonia aurea (*o-y*; 1); Bellium bellidioides (*w*; ½); Brachycome iberidifolia (*b* or *w*; 1); Calendula maderensis (*o*; 2); C. officinalis (*o*; 3); Campanula Erinus (*b-pi* or *w*; ½-¾); Castilleja pallida (*w* or *y*; ½-1); Cerinthe minor (*y*, spotted *br*; 1-1½); Chrysanthemum segetum (*y*; 1½); Clarkia elegans (*r*; 2); C. pulchella (*p*; 1½-2); Collinsia grandiflora (*p* and *b*; 1); Collomia coccinea (*r*; 1-1½); C. grandiflora (*r-y*; 1½-2); Coreopsis Drummondi (*y* and *r-br*; 1); Delphinium Ajacis (*b*, *r*, or *w*; 1-1½); Downingia elegans (*b* and *w*; ½); D. pulchella (*b* and *y*; ½); Eschscholtzia californica (*y*; 1½); E. c. crocea (*o*; 1); Eucharidium concinnum (*l-p*; 1); Fumaria capreolata (*w* and *p*; 4); Gilia capitata (*b*; 1-2); G. densiflora (*l* or *w*); G. liniflora (*w*; 1); G. micrantha (*pi*; ½); G. tricolor (*y-o*, and *p* or *w*; 1); Glaucium phœniceum (*r* and *bk*; ¾); Helianthus annuus (*y*; 6); Helichrysum bracteatum niveum (*w* and *y*); Heliotropium convolvulaceum (*w*, *sc*; 2); Iberis umbellata (variable; ½-1); Ionopsidium acaule (*l*, or *w* and *r*; ¼); Ipomœa purpurea (*p*; 10); Lasthenia glabrata (*y*; ¾-1½); Lathyrus grandiflorus (*pi*); L. odoratus vars.; Lavatera trimestris (*pi*; 3-6); Limnanthes Douglasii (*y* and *w*, *sc*; ½); Linaria reticulata (*p*, and *y* or *br*; 2-4); L. spartea (*y*); Linum grandiflorum (*pi*; ½-1); Loasa Pentlandii (*o*; 4); L. prostrata (*y*); L. vulcanica (*w*; 2); Lunaria annua (*r-l*; 1½-3); Lupinus luteus (*y*, *sc*; 1-1½); L. nanus (*l* and *b*; 1); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Mathiola annua (variable; 1-2); Nemesia cynanchifolia (*l-b*; 1½-2); N. floribunda (*w* and *y*, *sc*; 1); Nemophila insignis (*b*; 1½); N. maculata (*w* and *v-p*; ½); N. Menziesii (*w* to *b*; ½); Nigella damascena (*w* or *b*; 1-2); N. hispanica (*b*; 1-2); N. orientalis (*y* and *r*; 1½); Nolana paradoxa (*w*); N. tenella (*b*); Nonnea rosea (*pi*; ½-1); Œnothera amœna (*pi* and *r*; 1-2); Œ. bistorta Veitchiana (*y* and *r*); Œ. Whitneyi (*pi-r* and *r*; 1-1½); Œ. varieties; Omphalodes linifolia (*w*; ½-1); Oxalis stricta (*y*; 1½); O. valdiviensis (*y* and *r*; ½-¾); Papaver alpinum (*y*; ½); P. nudicaule (*o*, *y*, or *w*; ¾-1½); P. orientale (*r*, spotted *p*; 2-3) and vars.; P. pilosum (*r* and *w*, or *o* and *w*; 1-2); P. Rhœas (*r*; 1) and vars.; Phacelia campanularia (*b* and *w*; ½-¾); P. Whitlavia (*b*; 2); Podolepis aristata (*y* and *pi*; 1); Ranunculus aconitifolius (*w*; ½-2); R. anemonoides (*pi-w*; ¼-½); R. asiaticus (variable; ¾); R. gramineus (*y*; ½-1); R. parnassifolius (*w* or *p-w*; ¼-½); Reseda odorata (*y-w*, *sc*) and vars.; Sabbatia calycosa (*w*; ½-1½); S. campestris (*pi*; 1); Schizanthus pinnatus (variable; 2); Sedum glandulosum (*r-p*); Solenia aurea (*y*; ¾); Silene Atocion (*p*; ½-1); S. pendula (*pi-w*); Sonchus gummifer (*y*; 2-3); Statice Suworowi (*l*); Swertia corymbosa (*b*, or *b* and *w*; ¾-1½); Tropæolum peregrinum (*y*); Vicia onobrychioides (*p*; 2).

BIENNIALS.—Anagallis fruticosa (*r*; 2); Blumenbachia coronata (*w*; 1½); Campanula sibirica divergens (*v*; 1½); Celosia cretica (*y*, spotted *r-y*; 4-6); Dianthus chinensis (variable; ½-1); Digitalis purpurea (*p*, varying to *w*; 3-5); Glaucium flavum (*y*; 1-2); Grindelia grandiflora (*y* or *o*; 2½-3); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Lunaria annua (*r-l*; 1½-3); Meconopsis Wallichi (*b*; 4-6); Œnothera biennis (*y*, *sc*; 2-4); Salvia bicolor (*b-r*, dotted *o*, and *w*; 2-3); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Acantholimon glumaceum (*pi*); A. venustum (*pi*; ½-¾); Acanthus longifolius (*p*; 2-3); A. mollis (*w*; 3-4); A. spinosus (*p*; 3-4); Achillea ægyptiaca (*y*; 1½-2½); A. Ageratum (*w*; ½); A. asplenifolia (*pi*; 1½); A. aurea (*y*; 1½); A. Clavennæ (*w*; ¾); A. Eupatorium (*y*; 4-5); A. moschata (*w*; ½); A. pectinata (*w*; 1½); Aconitum angustifolium (*b*; 2-3); A. biflorum (*b*; 6); A. chinense (*b*; 4-6); A. delphinifolium (*b-p*; ½-2); A. eminens (*b*; 2-4); A. gracile (*b* or *v*; 2); A. Halleri (*v*; 4-6) and vars.; A. Napellus (*b*; 3-4); A. paniculatum (*v*; 2-3); A. pyrenaicum (*y*; 2); A. rostratum (*r*; 1-2); A. tauricum (*b*; 3-4); A. Wildenovii (*b-p*; 2-3); Acorus Calamus (*y*; 3); Actæa alba (*w*; 1-1½); Actinella grandiflora (*y*; ½-¾); Adenophora Lamarckii (*b*; 1-2); A. verticillata (*b*; 2-3); Ajuga australis (*b*; ½); A. pyramidalis (*b* or *p*; ½); Alchemilla alpina (*g*; 6); A. sericea (*g*; ½); Allium azureum (*b*; 1-2); A. cœruleum (*b*; ¾); A. Moly (*y*; 1-1½); A. neapolitanum (*w*; 1-1½); A. nigrum (*v* or *w*; 2½-3½); A. reticulatum atteuuifolium (*pi* or *w*; 1); A. roseum (*l-pi*; 1-1½); A. sphærocephalum (*r-p* and *g*; 1½-2½); Alströmeria aurantiaca (*o*; 3-4); A. chilensis (*p-r* or *p*; 2-3); A. Simsii (*y*, streaked *r*; 3); Althæa cannabina (*pi*; 5-6); A. flexuosa (*r*; 2-3); Alyssum alpestre (*y*; ¼); A. gemonense (*y*; 1); A. serpyllifolium (*y*; ¼); A. Wiersbeckii (*y*; 1½); Amsonia salicifolia (*b*; 1½-2½); A. Tabernæmontana (*b*; 1½-2½); Androsace argentea (*w*; ½); A. Chamæjasme (*pi-w*; ¼); A. lactea (*w*; ½); A. lanuginosa (*pi*; ½-¾); A. Vitaliana (*y*; ½); Anemone coronaria (variable; ½); A. decapetala (*w*; 1); A. dichotoma (*w*; 1½); A. multifida (*y* or *w-y*; ½-1); A. obtusiloba (*c*; ¾); A. patens (*p* or *y*; 1); Anomatheca cruenta (*r*; ½-1); Antennaria dioica (*fl pi*); Anthemis Aizoon (*w* and *y*; ½); Anthericum Liliago (*w*; 1-1½); A. Liliastrum (*w*; 1-2); A. ramosum (*w*; 2); Anthyllis montana (*pi* or *p*; ½-½); A. Vulneraria (*y*, *w*, *r*, or *pi*); Antirrhinum

June (Hardy Annuals)—*continued.*

glabrata (*y*; ¾-1½); Lathyrus grandiflorus (*pi*); L. odoratus vars.; Lavatera trimestris (*pi*; 3-6); Limnanthes Douglasii (*y* and *w*, *sc*; ½); Linaria reticulata (*p*, and *y* or *br*; 2-4); L. spartea (*y*); Linum grandiflorum (*pi*; ½-1); Loasa Pentlandii (*o*; 4); L. prostrata (*y*); L. vulcanica (*w*; 2); Lunaria annua (*r-l*; 1½-3); Lupinus luteus (*y*, *sc*; 1-1½); L. nanus (*l* and *b*; 1); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Mathiola annua (variable; 1-2); Nemesia cynanchifolia (*l-b*; 1½-2); N. floribunda (*w* and *y*, *sc*; 1); Nemophila insignis (*b*; 1½); N. maculata (*w* and *v-p*; ½); N. Menziesii (*w* to *b*; ½); Nigella damascena (*w* or *b*; 1-2); N. hispanica (*b*; 1-2); N. orientalis (*y* and *r*; 1½); Nolana paradoxa (*w*); N. tenella (*b*); Nonnea rosea (*pi*; ½-1); Œnothera amœna (*pi* and *r*; 1-2); Œ. bistorta Veitchiana (*y* and *r*); Œ. Whitneyi (*pi-r* and *r*; 1-1½); Œ. varieties; Omphalodes linifolia (*w*; ½-1); Oxalis stricta (*y*; 1½); O. valdiviensis (*y* and *r*; ½-¾); Papaver alpinum (*y*; ½); P. nudicaule (*o*, *y*, or *w*; ¾-1½); P. orientale (*r*, spotted *p*; 2-3) and vars.; P. pilosum (*r* and *w*, or *o* and *w*; 1-2); P. Rhœas (*r*; 1) and vars.; Phacelia campanularia (*b* and *w*; ½-¾); P. Whitlavia (*b*; 2); Podolepis aristata (*y* and *pi*; 1); Ranunculus aconitifolius (*w*; ½-2); R. anemonoides (*pi-w*; ¼-½); R. asiaticus (variable; ¾); R. gramineus (*y*; ½-1); R. parnassifolius (*w* or *p-w*; ¼-½); Reseda odorata (*y-w*, *sc*) and vars.; Sabbatia calycosa (*w*; ½-1½); S. campestris (*pi*; 1); Schizanthus pinnatus (variable; 2); Sedum glandulosum (*r-p*); Solenia aurea (*y*; ¾); Silene Atocion (*p*; ½-1); S. pendula (*pi-w*); Sonchus gummifer (*y*; 2-3); Statice Suworowi (*l*); Swertia corymbosa (*b*, or *b* and *w*; ¾-1½); Tropæolum peregrinum (*y*); Vicia onobrychioides (*p*; 2).

BIENNIALS.—Anagallis fruticosa (*r*; 2); Blumenbachia coronata (*w*; 1½); Campanula sibirica divergens (*v*; 1½); Celosia cretica (*y*, spotted *r-y*; 4-6); Dianthus chinensis (variable; ½-1); Digitalis purpurea (*p*, varying to *w*; 3-5); Glaucium flavum (*y*; 1-2); Grindelia grandiflora (*y* or *o*; 2½-3); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Lunaria annua (*r-l*; 1½-3); Meconopsis Wallichi (*b*; 4-6); Œnothera biennis (*y*, *sc*; 2-4); Salvia bicolor (*b-r*, dotted *o*, and *w*; 2-3); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Acantholimon glumaceum (*pi*); A. venustum (*pi*; ½-¾); Acanthus longifolius (*p*; 2-3); A. mollis (*w*; 3-4); A. spinosus (*p*; 3-4); Achillea ægyptiaca (*y*; 1½-2½); A. Ageratum (*w*; ½); A. asplenifolia (*pi*; 1½); A. aurea (*y*; 1½); A. Clavennæ (*w*; ¾); A. Eupatorium (*y*; 4-5); A. moschata (*w*; ½); A. pectinata (*w*; 1½); Aconitum angustifolium (*b*; 2-3); A. biflorum (*b*; 6); A. chinense (*b*; 4-6); A. delphinifolium (*b-p*; ½-2); A. eminens (*b*; 2-4); A. gracile (*b* or *v*; 2); A. Halleri (*v*; 4-6) and vars.; A. Napellus (*b*; 3-4); A. paniculatum (*v*; 2-3); A. pyrenaicum (*y*; 2); A. rostratum (*r*; 1-2); A. taurieum (*b*; 3-4); A. Wildenovii (*b-p*; 2-3); Acorus Calamus (*y*; 3); Actæa alba (*w*; 1-1½); Actinella grandiflora (*y*; ½-¾); Adenophora Lamarckii (*b*; 1-2); A. verticillata (*b*; 2-3); Ajuga australis (*b*; ½); A. pyramidalis (*b* or *p*; ½); Alchemilla alpina (*g*; 6); A. sericea (*g*; ½); Allium azureum (*b*; 1-2); A. cœruleum (*b*; ¾); A. Moly (*y*; 1-1½); A. neapolitanum (*w*; 1-1½); A. nigrum (*v* or *w*; 2½-3½); A. reticulatum atteuuifolium (*pi* or *w*; 1); A. roseum (*l-pi*; 1-1½); A. sphærocephalum (*r-p* and *g*; 1½-2½); Alströmeria aurantiaca (*o*; 3-4); A. chilensis (*p-r* or *p*; 2-3); A. Simsii (*y*, streaked *r*; 3); Althæa cannabina (*pi*; 5-6); A. flexuosa (*r*; 2-3); Alyssum alpestre (*y*; ¼); A. gemonense (*y*; 1); A. serpyllifolium (*y*; ¼); A. Wiersbeckii (*y*; 1½); Amsonia salicifolia (*b*; 1½-2½); A. Tabernæmontana (*b*; 1½-2½); Androsace argentea (*w*; ½); A. Chamæjasme (*pi-w*; ¼); A. lactea (*w*; ½); A. lanuginosa (*pi*; ½-¾); A. Vitaliana (*y*; ½); Anemone coronaria (variable; ½); A. decapetala (*w*; 1); A. dichotoma (*w*; 1½); A. multifida (*y* or *w-y*; ½-1); A. obtusiloba (*c*; ¾); A. patens (*p* or *y*; 1); Anomatheca cruenta (*r*; ½-1); Antennaria dioica (*fl pi*); Anthemis Aizoon (*w* and *y*; ½); Anthericum Liliago (*w*; 1-1½); A. Liliastrum (*w*; 1-2); A. ramosum (*w*; 2); Anthyllis montana (*pi* or *p*; ½-½); A. Vulneraria (*y*, *w*, *r*, or *pi*); Antirrhinum

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Asarina (*r* and *y*; ½); A. tortuosum (*p*; 1-1½); Aphyllanthes monspeliensis (*b*; 1); Apios tuberosa (*br-p*, *sc*; ½); Aquilegia Bertoloni (*b-v*; 1); A. cærulea (*b* and *w*, or *w*; ¾-1¼); A. californica (*y* and *o-r*; 2-4); A. canadensis (*r* and *y*; 1-2); A. chrysantha (*y* and *p*; 3-4); A. formosa (*r* and *y*; 2-4); A. fragrans (*w* or *r-p*, *sc*; 1½-2); A. pyrenaica (*l-b*; ¾-1); A. sibirica (*l*; 1); Arabis arenosa (*pi*, *w*, or *b*; ½); A. lucida (*w*; ¼-½) and vars.; A. petræa (*w*; ¼); A. rosea (*pi-p*; 1); Arenaria balearica (*w*; ¼); A. graminifolia (*w*; ½-¾); A. grandiflora (*w*; ¼-½); A. laricifolia (*w*; ½); A. longiflora (*w*; ½-¾); A. peploides (*w*; ¼); Arisæma triphylla (*p-b* and *g*; ¾-1); Armeria dianthoides (*pi*; ½); A. juncea (*r-pi*; ¼); A. juniperifolia (*pi*; ½); A. plantaginea (*pi*; 1); A. setacea (*pi*; ¼); A. vulgaris (*pi*, *pi-r*, *l*, or *w*; ½-1); Arnica scorpioides (*y*; ½-1); Artemisia alpina (*y*; ½-¾); A. Stelleriana (*y*; 1-2); Asarum canadense (*br*; 1); Asperula longiflora (*w*, *y*, and *r*; ½); A. montana (*pi*; ½-¾); A. odorata (*w*; ½-1); A. orientalis (*b*; 1); Aster altaicus (*b-p*; 1); A. Bigelovii (*l* and *y*; 2½); A. pulchellus (*p*; 1); Astragalus adsurgens (*b-p*); A. alopecuroides (*y*; 2-5); A. arenarius (*b*; ½); A. maximus (*y*; 2-3); A. monspessulanus (*p*; ½); A. vulpinus (*y*; 2-3); Astrantia helleborifolia (*pi*; 1-2); Baptisia alba (*w*; 2); B. australis (*b*; 4-5); B. confusa (*b*; 1-2); B. exaltata (*b*; 3-4); Bellidiastrum Michelii (*w*; 1); Bellis perennis (*w*; ¼) and vars.; Bellium crassifolium (*w-y*; ½); B. minutum (*w* and *y*; ½); Biarum tenuifolium (*br-p*; ½); Bocconia cordata (buff; 5-8); Borago laxiflora (*b*); B. officinalis (*b*; 1-2); Brodiæa coccinea (*r* and *y-g*; 1½); B. congesta (*b*; 1); B. grandiflora (*b-p*; 1½); B. lactea (*w* and *g*; 1-2); Bulbine alooides (*y*; 1); Buphthalmum grandiflorum (*y*; 1½); B. salicifolium (*y*; 1½); Butomus umbellatus (*aq*, *pi*); Cacalia tuberosa (*w*; 2-6); Calamintha grandiflora (*p*; 1); Calliprora lutea (*p-br*; ¾); Callirhoe digitata (*r-p*; 2-3); C. involucrata (*r*; ½); C. Papaver (*v-r*; 3); Calochortus albus (*w*, blotched *r*; 1-1½); C. Benthami (*y*; ½-¾); C. elegans (*g*, *w*, and *p*; ¾); C. lilacinus (*pi*; ½-¾); C. Nuttallii (*g*, *w*, *r* and *p*; ½); Caloscordum nerinæflorum (*pi*; ½); Caltha leptosepala (*w*; 1); Calypso borealis (*pi*, *br*, and *y*); 1); Calystegia Soldanella (*r* and *y*; ¼); Camassia esculenta (*b*; 1); Campanula barbata (*b* or *w*; ½-1½); C. cæspitosa (*b* or *w*; ¼-½); C. carpathica (*b* or *w*; ¾) and vars.; C. cenisia (*b*; ¼); C. Elatines (*b-p*; ¼-½); C. garganica (*b*; ¼-½); C. glomerata (*b-v* or *w*; 1-2) and vars.; C. grandis (*v-b* or *w*; 1-2); C. nitida (*b* or *w*; ¼-¾); C. Portenschlagiana (*b-p*; ½-¾); C. pulla (*v-b*; ¼-½); C. Raineri (*b*; ¼); C. rapunculoides (*b-v*; 2-4) and vars.; C. rotundifolia (*b*; ½-1) and vars.; C. speciosa (*b*, *p*, or *w*; 1-1½); C. Waldsteiniana (*v-b*; ¼-½); C. Zoysii (*b*; ¼); Cedronella cordata (*p*; ¼-½); Centaurea atropurpurea (*p*; 3); C. dealbata (*pi*; 1-1½); C. montana (*b*; 2) and vars.; Centranthus ruber (*r*; 2-3); Cephalanthera ensifolia (*w*; 1-2); C. grandiflora (*w*; 1-1½); C. rubra (*pi-p*; ½-1½); Cerastium alpinum (*w*; ¼); C. Biebersteinii (*w*; ½); C. Boissieri (*w*; ¼-1); C. tomentosum (*w*; ½); Cerinthe maculata (*y*, spotted *p*; 1-1½); Cheiranthus Cheiri (variable; 1-2); Chimaphila corymbosa (*g-w*, tinged *r*; ¼-½); C. maculata (*w*; ¼); Chlorogalum pomeridianum (*w*, veined *p*; 2); Chrysobactron Hookeri (*y*; 1½-3); Cineraria alpestris (*y*; 2); Clematis recta (*w*, *sc*; 2-3); Cnicus acaulis (*p*; 2); C. spinosissimus (*y*; 3); C. undulatus (*p*; 1); Commelina virginica (*b*; ½); Coreopsis auriculata (*y* and *p-br*; 1-1½); C. grandiflora (*y*; 3-4); C. lanceolata (*y*; 1-3); C. verticillata (*y*; 1-2); Coris monspeliensis (*l*; ½); Coronilla varia (*pi* and *w*, or *w*; 1); Corydalis bracteata (*g-y*; ¾); Crambe cordifolia (*w*, *sc*; 6); Crinum capense (*r*); Cynanchum roseum (*pi-r*; 1-1½); Cypripedium acaule (*g*, *pi*, and *p*); C. candidum (*g-br* and *w*; 1); C. guttatum (*w* and *pi-p*; ½-¾); C. pubescens (*y-br* and *y*; 1½-2); C. spectabile (*w* and *pi*; 1½-3); Delphinium exaltatum (*b* or *w*; 3-6); D. formosum (*b* and *v*; 1½-3); D. grandiflorum (*b* or *w*; 1-2); D. nudicaule (*r* and *y*; 1-1½); Dianthus alpinus (*pi* and *r*; ¼); D. arenarius (*w*); D. atrorubens (*r*; 1); D. barbatus vars.; D. cæsius (*pi*, *sc*; ¼-½); D. cruentus (*r*); D. fimbriatus (*pi*; 1); D. Fischeri (*pi*); D. glacialis (*r-p*; ¼); D. monspessulanus (*r*; ½-1); D. neglectus (*pi*; ¼); D. petræus (*pi*; ½); D. plumarius (*w* and *p*, *sc*; ¾-1); D. Seguierii (*pi-p*; 1); D. superbus (*pi*, *sc*; ¾-1½) and var.; Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Dictamnus albus (*w*; 1-1½); Diphylleia cymosa (*w*; 1); Dodecatheon integrifolium (*pi-r* and *w*; ¼-½); Doronicum plantagineum excelsum (*y*; 5); Dracocephalum speciosum (*pi-b*; 1½); Drosera filiformis (*p*; 1); Drypis spinosa (*pi* or *w*; ½); Echinops commutatus (*w*; 5-7); E. Ritro (*b*; 3); Epilobium obcordatum (*pi-p*); Epimedium macranthum (*w*; 10-15); E. pinnatum (*y*; 8-12); Eremurus spectabilis (*y-y* and *o*; 2); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Erinus alpinus (*p*; ½); Erodium macradenum (*v* and *p*; ½); E. Manescavi (*p-r*; 1-2); E. pelargoniiflorum (*w* and *p*); E. petræum (*p*; ¼-½); E. trichomanefolium (*pi-w*; ¼-½); Eryngium Bourgati (*b*; 1-2); Erysimum ochroleucum (*y*); E. pumilum (*g-y*, *sc*; ¼); Ferrula communis (*y*; 8-12); F. glauca (*y*; 6-8); F. tingitana (*y*; 6-8); Fritillaria Hookeri (*l*; ½); F. macrophylla (*pi*; 3); F. pyrenaica (*p*; 1½); Funkia Sieboldiana (*w*); Galega officinalis (*b*; 3-4); G. orientalis (*b*; 2-4); Galtonia candicans (*w*; *sc*); Gentiana affinis (*b*; ½-1); G. algida (*w* and *b*; ¼-½); G. cruciata (*b*; ½); G. punctata (*y*; 1-2); G. septemfida (*b*; ½-1½); Geranium argenteum (*r*; ¼); G. cinereum (*r*; ½); G. macrorhizon (*r* or *p*; 1); Geum pyrenaicum (*y*; 1½); G. rivale (*r*; 1-3); Gillenia trifoliata (varying from *r* to *w*; 1½); Gladiolus byzantinus (*r*; 2); Globularia nana (*b*); G. nudicaulis (*b*; ½); G. vulgaris (*b*; ½); Glycyrrhiza glabra (*b*; 3-4); Gypsophila paniculata (*w*; 2-3); Habenaria blephariglottis (*w*); H. fimbriata (*l-p*; 1-1½); H. psycodes (varying from *pi* to *r*, *sc*); Hedysarum coronarium (*r*; 3-5); Helichrysum arenarium (*y*; ½-1); Hemerocallis Dumortieri (*o-y*; 1-1½); H. flava (*o-y*, *sc*; 2-3); H. fulva (*y*; 2-4); H. Middendorfii (*y*; 2-3); H. minor (*y*, *sc*; ¼-¾); Hesperis matronalis (variable; 2-3); Heuchera americana (*r*; 1½); H. hispida (veined *p*); H. sanguinea (*r*; ¾-1½); Hieracium aurantiacum (*o-r*; 1-1½); Hottonia palustris (*aq*, *l* and *y*; 1-2); Houstonia cærulea (*b* or *w*; ¼); H. serpyllifolia (*w*; ¼); Humulus Lupulus (*g-y*); Hypericum elegans (*y*; 1); H. patulum (*y*; 6); H. perforatum (*y*; 1-3); Incarvillea Olgæ (*pi*; 3-4½); Ipomœa pandurata (*w* and *p*); Iris aurea (*y*; 3-4); I. Douglasiana (*l-p*; ½-1); I. ensata (*l-p* and *y*); I. fœtidissima (*b-l*; 2-3); I. fulva (*y-br*; 2-3); I. Guldenstädtiana (*w*, *o*, and *y*; 2); I. hybrida (*w*, *l-p*, and *y*); I. iberica (*w* or *l*, *p*, and *p-br*; ¼-½); I. lævigata (*p* and *y*; 1½-2); I. Monnieri (*g-y*, *sc*; 3-4); I. neglecta (*l*, *w*, and *y*; 1½-2); I. ochroleuca (*w* and *y*; 3); I. sibirica (*l-b* and *v*; 1-2½); I. squalens (*l-p* and *y*; 2-3); I. tectorum (*l* and *w*; 1); I. versicolor (*p*; 1-2); I. vulgare (*p*; 1-2); Lamium maculatum (*p*); Lathyrus magellanicus (*b-p*); L. roseus (*pi*); L. rotundifolius (*pi*); Lavandula vera (*b* or *w*; 1-2); Leucoium æstivum (*w* and *g*; 1½); L. Hernandezii (*w* and *g*; 1-1½); Lilium auratum (*w*, *y*, and *p*; 2-4); L. bulbiferum (*r*; 2-4); L. canadense (*y* or *r*, and *p*; 1½-3); L. candidum (*w*; 2-3); L. Catesbæi (*o-r* and *p*; 2-3); L. chalcedonicum (*r*; 2-3); L. longiflorum (*w*, *sc*; 1-2); L. Martagon (*p-r* and *p*); L. pardalinum (*o-r* and *p*; 3-7); L. Parryi (*y* and *br-r*, *sc*; 2-6); L. philadelphicum (*o-r* and *p*; 1-3); L. pomponium (*r* or *r-o*; 1½-3); L. pyrenaicum (*y*; 2-4); L. speciosum (*w*, or *p-r* and *w*; 1-3); L. tenuifolium (*r*; ½-1); L. Washingtonianum (*w*, and *p* or *l*, *sc*; 3-5); Limnanthemum nymphæoides (*aq*, *y*); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); L. dalmatica (*y*; 3-4); L. hepaticæfolia (*l-p*; ¼); L. triornithophora (*p* and *y*); Linum narbonense (*b* or *w*; 2); Lithospermum Gastoni (*b*; 1-1½); L. purpureocæruleum (*r*, turning *p*; 1); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus leucophyllus (*pi*; 2-3); L. nootkatensis (*b*, and *p*, *w*, or *y*; 1-1½); L. ornatus (*b*; 1-2); L. perennis (*b*; 2); L. polyphyllus (*b*; 4); Lychnis alpina (*pi*; ½); L. chalcedonica (*r*; 1½-3½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. f. Haageana (*r*); L. Lagascæ (*pi* and *w*; ¼);

June (Hardy Perennials)—*continued.*

D. fimbriatus (*pi*; 1); D. Fischeri (*pi*); D. glacialis (*r-p*; ¼); D. monspessulanus (*r*; ½-1); D. neglectus (*pi*; ¼); D. petræus (*pi*; ½); D. plumarius (*w* and *p*, *sc*; ¾-1); D. Seguierii (*pi-p*; 1); D. superbus (*pi*, *sc*; ¾-1½) and var.; Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Dictamnus albus (*w*; 1-1½); Diphylleia cymosa (*w*; 1); Dodecatheon integrifolium (*pi-r* and *w*; ¼-½); Doronicum plantagineum excelsum (*y*; 5); Dracocephalum speciosum (*pi-b*; 1½); Drosera filiformis (*p*; 1); Drypis spinosa (*pi* or *w*; ½); Echinops commutatus (*w*; 5-7); E. Ritro (*b*; 3); Epilobium obcordatum (*pi-p*); Epimedium macranthum (*w*; 10-15); E. pinnatum (*y*; 8-12); Eremurus spectabilis (*y-y* and *o*; 2); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Erinus alpinus (*p*; ½); Erodium macradenum (*v* and *p*; ½); E. Manescavi (*p-r*; 1-2); E. pelargoniiflorum (*w* and *p*); E. petræum (*p*; ¼-½); E. trichomanefolium (*pi-w*; ¼-½); Eryngium Bourgati (*b*; 1-2); Erysimum ochroleucum (*y*); E. pumilum (*g-y*, *sc*; ¼); Ferrula communis (*y*; 8-12); F. glauca (*y*; 6-8); F. tingitana (*y*; 6-8); Fritillaria Hookeri (*l*; ½); F. macrophylla (*pi*; 3); F. pyrenaica (*p*; 1½); Funkia Sieboldiana (*w*); Galega officinalis (*b*; 3-4); G. orientalis (*b*; 2-4); Galtonia candicans (*w*; *sc*); Gentiana affinis (*b*; ½-1); G. algida (*w* and *b*; ¼-½); G. cruciata (*b*; ½); G. punctata (*y*; 1-2); G. septemfida (*b*; ½-1½); Geranium argenteum (*r*; ¼); G. cinereum (*r*; ½); G. macrorhizon (*r* or *p*; 1); Geum pyrenaicum (*y*; 1½); G. rivale (*r*; 1-3); Gillenia trifoliata (varying from *r* to *w*; 1½); Gladiolus byzantinus (*r*; 2); Globularia nana (*b*); G. nudicaulis (*b*; ½); G. vulgaris (*b*; ½); Glycyrrhiza glabra (*b*; 3-4); Gypsophila paniculata (*w*; 2-3); Habenaria blephariglottis (*w*); H. fimbriata (*l-p*; 1-1½); H. psycodes (varying from *pi* to *r*, *sc*); Hedysarum coronarium (*r*; 3-5); Helichrysum arenarium (*y*; ½-1); Hemerocallis Dumortieri (*o-y*; 1-1½); H. flava (*o-y*, *sc*; 2-3); H. fulva (*y*; 2-4); H. Middendorfii (*y*; 2-3); H. minor (*y*, *sc*; ¼-¾); Hesperis matronalis (variable; 2-3); Heuchera americana (*r*; 1½); H. hispida (veined *p*); H. sanguinea (*r*; ¾-1½); Hieracium aurantiacum (*o-r*; 1-1½); Hottonia palustris (*aq*, *l* and *y*; 1-2); Houstonia cærulea (*b* or *w*; ¼); H. serpyllifolia (*w*; ¼); Humulus Lupulus (*g-y*); Hypericum elegans (*y*; 1); H. patulum (*y*; 6); H. perforatum (*y*; 1-3); Incarvillea Olgæ (*pi*; 3-4½); Ipomœa pandurata (*w* and *p*); Iris aurea (*y*; 3-4); I. Douglasiana (*l-p*; ½-1); I. ensata (*l-p* and *y*); I. fœtidissima (*b-l*; 2-3); I. fulva (*y-br*; 2-3); I. Guldenstädtiana (*w*, *o*, and *y*; 2); I. hybrida (*w*, *l-p*, and *y*); I. iberica (*w* or *l*, *p*, and *p-br*; ¼-½); I. lævigata (*p* and *y*; 1½-2); I. Monnieri (*g-y*, *sc*; 3-4); I. neglecta (*l*, *w*, and *y*; 1½-2); I. ochroleuca (*w* and *y*; 3); I. sibirica (*l-b* and *v*; 1-2½); I. squalens (*l-p* and *y*; 2-3); I. tectorum (*l* and *w*; 1); I. versicolor (*p*; 1-2); I. vulgare (*p*; 1-2); Lamium maculatum (*p*); Lathyrus magellanicus (*b-p*); L. roseus (*pi*); L. rotundifolius (*pi*); Lavandula vera (*b* or *w*; 1-2); Leucoium æstivum (*w* and *g*; 1½); L. Hernandezii (*w* and *g*; 1-1½); Lilium auratum (*w*, *y*, and *p*; 2-4); L. bulbiferum (*r*; 2-4); L. canadense (*y* or *r*, and *p*; 1½-3); L. candidum (*w*; 2-3); L. Catesbæi (*o-r* and *p*; 2-3); L. chalcedonicum (*r*; 2-3); L. longiflorum (*w*, *sc*; 1-2); L. Martagon (*p-r* and *p*); L. pardalinum (*o-r* and *p*; 3-7); L. Parryi (*y* and *br-r*, *sc*; 2-6); L. philadelphicum (*o-r* and *p*; 1-3); L. pomponium (*r* or *r-o*; 1½-3); L. pyrenaicum (*y*; 2-4); L. speciosum (*w*, or *p-r* and *w*; 1-3); L. tenuifolium (*r*; ½-1); L. Washingtonianum (*w*, and *p* or *l*, *sc*; 3-5); Limnanthemum nymphæoides (*aq*, *y*); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); L. dalmatica (*y*; 3-4); L. hepaticæfolia (*l-p*; ¼); L. triornithophora (*p* and *y*); Linum narbonense (*b* or *w*; 2); Lithospermum Gastoni (*b*; 1-1½); L. purpureocæruleum (*r*, turning *p*; 1); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus leucophyllus (*pi*; 2-3); L. nootkatensis (*b*, and *p*, *w*, or *y*; 1-1½); L. ornatus (*b*; 1-2); L. perennis (*b*; 2); L. polyphyllus (*b*; 4); Lychnis alpina (*pi*; ½); L. chalcedonica (*r*; 1½-3½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. f. Haageana (*r*); L. Lagascæ (*pi* and *w*; ¼);

June (Hardy Perennials)—*continued.*

L. pyrenaica (*pi-w*; ¼); L. vespertina (*w*, *sc* at evening; 1-3); L. Viscaria (*pi*; 1); Lysimachia atropurpurea (*p*; 2); L. Nummularia (*y*); L. vulgaris (*y*; 2-3); Malva moschata (*pi*; 2-2½); Marshallia cæspitosa (*b-w*; 1); Meconopsis cambrica (*y*; 1); Mertensia alpina (*b*; ½-¾); M. sibirica (*p-b*; ½-1½); M. virginica (*p-b*; 1-2); Mimulus cardinalis (*r*; 1-3); M. luteus (*y*; ¾-1); M. l. cupreus (*r-br*, *p-br*, or *r*; ¾-1); M. moschatus (*y*); Mitchella repens (*w* and *p*, *sc*); Mœhringia muscosa (*w*; ¼); Monarda fistulosa (*p*; 2-5); Morina longifolia (*r*; 2); Muscari comosum monstrosum (*b-v*; 1-1½); Mutisia decurrens (*o*); Myosotis alpestris (*b*, *sc* at night; ½); Nothosoordum fragrans (*w*, *sc*; 1½-2); Nuphar advena (*aq*, *r*); N. luteum (*aq*, *y*, *sc*); Nymphæa alba (*aq*, *w*); Œnothera acaulis (*w*, turning *r*; ½); Œ. glauca (*y*; 1-2); Œ. g. Fraseri (*y*; 1); Œ. linearis (*y*; ¾-1½); Œ. pallida (*w* and *y*, turning *r*; 1½); Œ. speciosa (*w*, turning *r*; 2-3); Œ. taraxacifolia (*w*, turning *r*; ½); Omphalodes Luciliæ (*l-b*; ½-½); Ononis Natrix (*y*; 1½-2); O. rotundifolia (*pi*; 1-1½); Onosma stellulatum tauricum (*y*; ½-¾); Orchis latifolia (*p* or *r*; 1); O. maculata (*p* or *w*, and *p-br*; 1); Ornithogalum arabicum (*w* and *bk*, *sc*; 1-2); O. narbonense (*w* and *g*; 1-1½); O. pyramidale (*w*; 1½-2); Orobus aurantius (*y*; 1½); Ourisia coccinea (*r*; ½-1); Oxalis corniculata (*y*); O. enneaphylla (*w* or *pi*; ½); O. tetraphylla (*r* or *p-v*); Oxytropis pyrenaica (*b*; ¼-½); Pæonia albiflora (*w* or *pi*; 2-3); P. tenuifolia (*r*; 1-1½); Pancratium illyricum (*w*; 1½); P. maritimum (*w*; 2); Pedicularis dolichorhiza (*o-y*; 1-1½); P. flammea (*r*; ½-1); P. verticillata (*pi* or *w*; ½-1); Peltaria alliacea (*w*; 1); Pentstemon antirrhinoides (*y*; ¾-1½); P. campanulata (variable; 1½); P. Hartwegi (*r* or *r-p*; 2); P. Menziesii Douglasii (*l-p* and *pi-r*; 1); P. venustus (*p*; 2); Phlox amœna (*p*, *pi*, or *w*; 1½); Phormium Cookianum (*y*; 3-6) and var.; Phytolacca decandra (*w*; 3-10); Pinguicula grandiflora (*v-b*); Polemonium cæruleum (*b*; 2); P. confertum (*b*; ½); Polygonatum multiflorum (*w*; 2-3); Polygonum cuspidatum (*c-w*; 4-8); Potentilla ambigua (*y*; ½); P. argyrophylla (*y*; 1½-3); P. grandiflora (*y*); P. Hopwoodiana (*pi* and *y*; 1½); P. nitida (*pi*); P. Saxifraga (*w*; ¼-½); Pratia angulata (*w*; ½); P. repens (*v-w*; ½); Primula auriculata (*p* and *w*; ½); P. calycina (*p*); P. capitata (*v-b*, ½-¾); P. cortusoides (*pi*; ½-¾); P. denticulata (*l*; ¾-1); P. farinosa (*p* and *y*; ¼-1); P. glutinosa (*b-p*; ½); P. luteola (*y*; 1½-2); P. marginata (*v-pi*; ½); P. minima (*pi* or *w*); P. mollis (*r* and *p-r*; 1-1½); P. obconica (*w*; ½-1); P. scotica (*p* and *y*; ½); P. sikkimensis (*y*; 1½-2); P. viscosa (*pi-p* and *w*; ½); Pulmonaria saccharata (*pi*; 1); Pyrethrum achilleæfolium (*y*; 2); P. Tchihatchewii (*y* and *w*; 2); Pyrola rotundifolia (*w*, *sc*; ½); Pyxidanthera barbulata (*w* or *pi*; ¼); Rudbeckia speciosa (*o*; 2-3); Ruscus Hypophyllum (*g*; 1-1½); Salvia hians (*b*; 2); Saponaria ocymoides (*r* or *pi*); Saussurea pulchella (*p*; 2); Saxifraga aizoides (*o-y*, dotted *r*); S. aretioides (*o-y*; ½); S. Burseriana (*c*); S. cæsia (*c*; ½); S. Cotyledon (*w*; 1-2); S. granulata (*w*; ½-1½); S. hypnoides (*w*); S. lingulata cochlearis (*w*); S. Maweana (*w*); S. moschata (*y* or *p*; ½); S. purpurascens (*p*; ½-½); S. pygmæa (*y*; ½); S. retusa (*p*); S. Rocheliana (*w*; ½) and var.; S. sancta (*y*); S. sarmentosa (*w*, spotted; ¾); S. umbrosa (*pi-w*; ½-1); S. virginiensis (*w*; ½-¾); Scabiosa amœna (*l* or *pi*; 2-3); S. caucasica (*b*; 1); Scilla nutans (*b*, *p*, *w*, or *pi*) and var.; Scorzonera hispanica (*y*; 3); Sedum album (*w*; ½-½); S. japonicum (*y*); S. reflexum (*y*; ¾); S. Rhodiola (*g* or *r-p*); Sempervivum arachnoideum (*r* and *p*) and var.; S. arenarium (*y*; ½-¾); S. atlanticum (*r*; 1); S. calcaratum (*r-w*; 1); S. calcareum (*g-r*; 1); S. Lamottei (*pi* and *p*; 1); S. montanum (*m-p*; ½); S. soboliferum (*y*; ½-¾); S. Wulfeni (*y* and *m-p*; ½-¾); Senecio Doronicum (*y*; 1); S. pulcher (*p* and *y*; 1-2); Sida Napæa (*w*; 4-10); Silene acaulis (*pi* or *w*; ½); S. alpestris (*w*; ½); S. maritima (*w*); S. Saxifraga (*y*; ½-½); S. Schafta (*p*; ½); S. virginica (*r*; 1-2); Solanum crispum (*b-p*; 12-14); Solidago Drummondii (*y*; 1-3); Spiræa Filipendula (*w* or *pi*; 2-3); S. palmata (*r*; 1-2); S. Ulmaria (*w*; 2-4); Statice latifolia (*b*; 1); S. tatarica (*r*; 1); Symphyandra Wanneri (*b*; ½); Symphytum tuberosum (*o*; 1-2); Tanacetum leucophyllum (*o-y*; ¾); Thalictrum aquilegifolium (*w*, or *w* and *p*; 1-3); T. tuberosum (*w*; 1); Thermopsis barbata (*p*; 1); T. montana (*y*; 1-2); Trifolium alpestre (*p*; ½-1); T. Lupinaster (*p*; 1-1½); T. uniflorum (*b* and *p*; ½); Trollius europæus (*y*; ½-2); Tropæolum polyphyllum (*y*); T. speciosum (*r*); Tulipa Gesneriana (variable; 2); Veratrum nigrum (*bk-p*; 2-3); Vesicaria utriculata (*y*; 1); Vicia argentea (*pi*, spotted *bk*; 1); Viola cornuta (*b*); V. pedata (*b* or *w*); V. rothomagensis (*b*, striped *bk*); V. tricolor (*p*, *w*, or *o-y*; ½-1½); Wahlenbergia Kitaibelii (*p-b*; ½); W. tenuifolia (*v-b* and *w*; ½-½); Waldsteinia fragarioides (*y*); Zygadenus glaberrimus (*w*; 2).

SHRUBS.—Abutilon striatum (*o-y*; 10); Actinidia Kolomikta (*w*); A. volubilis (*w*); Adenocarpus hispanicus (*y*; 2-4); A. telonensis (*y*; 2-4); Æthionema coridifolium (*pi-l*; ½-¾); Æ. grandiflorum (*pi*; 1½); Æ. saxatilis (*p*; ¾); Ammodendron Sieversii (*p*; 2); Amorpha fruticosa (*b-p*; 6); Asclepias Douglasii (*p-l*; 2-3); Astragalus Tragacantha (*v*; 1½-3); Azalea nudiflora (variable; 3-4); Benthamia fragifera (*w*; 10-15); Berberis floribunda (*y*; 10); Bignonia capreolata (*o*; 20); Calceolaria alba (*w*; 1); Calophaca wolgarica (*y*; 2-3); Calycanthus occidentalis (*r*, *sc*; 6-12); Capparis spinosa (*w* and *r*; 3); Cassiope hypnoides (*r* and *w*; ½); Ceanothus americanus (*w*); C. dentatus (*b*; 4-6); C. floribundus (*b*); Celastrus scandens (*y*); Clematis cærulea (*v*; 8) and vars.; C. florida (*w*; 10); C. Fortunei (*w*, *sc*; 10); C. graveolens (*y*; 15); C. lanuginosa (*b*; 10); C. virginiana (*w*, *sc*; 15-20); C. Viticella (*b*, *p*, or *pi*; 20); Colutea arborescens (*y*; 6-10); Convolvulus lanuginosus (*y*); Cornus sanguinea (*g-w*; 6-8); C. sericea (*w*; 5-8); C. stricta (*w*; 8-15); Cotoneaster vulgaris (*r*; 3-5); C. spinosa (*y*; 1); C. Umbilicus (*y*; ½); Cratægus Crus-galli ovalifolia (*w*; 10-20); C. C.-g. prunifolia (*w*; 15-20); C. nigra (*w*; 10-20); C. odoratissima (*w*, *sc*; 10-20); C. orientalis (*w*; 12-20); Cytisus hirsutus (*y*); Dabœcia polifolia (*w*, *pi*, or *p*; 1-2); Decumaria barbara (*w*; *sc*); Dendromecon rigida (*y*); Diervilla grandiflora (*pi*; 8); Dorycnium suffruticosum (*w* and *r*; 2); Dryas Drummondi (*y*); D. octopetala (*w*); Enkianthus campanulatus (*g-w* and *r*); Ephedra vulgaris (*w*; 1-2); Euonymus atropurpureus (*p*; 6-14); Halimodendron argenteum (*p*; 4-6); Helianthemum formosum (*y* and *bk*; 4); H. halimifolium (*y*; 3-4); H. vulgare (*y*); Hydrangea hortensis (variable; 2-3); H. paniculata grandiflora (*w*); Hypericum calycinum (*y*; 1); Iberis correæfolia (*w*; 1); I. saxatilis (*w*; ½-½); I. sempervirens (*w*; ¾-1); Jasminum officinale (*w*, *sc*); Kalmia angustifolia (*p* or *r*; 2-3); K. latifolia (*pi*, varying to *w*; 3-10); Kerria japonica (*o-y*; 3-4); Laburnum alpinum (*y*; 15-20); L. vulgare (*y*; 20); Leucothoë racemosa (*w*; 4-10); Ligustrum Ibota (*w*); L. japonicum (*w*, *sc*; 6-8); L. Massalongianum (*w*, *sc*; 6); L. ovalifolium (*w*); Linnæa borealis (*pi-w*); Lithospermum prostratum (*b* and *r-v*); Lonicera Caprifolium (*y* and *b*, *sc*); L. flava (*y*, *sc*); L. Periclymenum (*r*); Lupinus arboreus (*y*, *sc*); Lycium afrum (*v*; 6-10); L. barbarum (*p* and *y*); Magnolia glauca (*w*, *sc*; 15); Margyricarpus setosus (*g*; 2-4); Neillia opulifolia (*w*; 5); Opuntia Engelmanni (*y*; 4-6); O. missouriensis (*y*); Osmanthus fragrans (*y* or *w*; 6-10); Passiflora cærulea (*p*, *w*, and *b*, *sc*); Philadelphus grandiflorus (*w*, *sc*; 6-10); P. hirsutus (*w*; 3); P. inodorus (*w*; 6); Phlomis ferruginea (*y*; 2-3); P. fruticosa (*y*; 2-4); Potentilla fruticosa (*y*; 2-4); Pyrus americana (*w*) and var.; P. arbutifolia (*w* or *p-w*; 2-10); P. Chamæmespilus (*r*; 5-6); Rhododendron ferrugineum (*r* and *y*; 1); R. hirsutum (*r*; 1-2); Rhus Cotinus (*p* or *pi-c*; 6-8); R. glabra (*g-y* or *g-r*; 5-18) and var.; R. Toxicodendron (*g-y*); R. typhina (*g-y*; 10-30); Robinia hispida (*pi*; 3-8); Rosa acicularis (*pi-w*; 8); R. alba (*w* or *pi-w*, *sc*; 4-7); R. alpina (*pi* or *r*; 3) and vars.; R. Banksiæ (*w*, *sc*; 20); R. blanda (*pi*; 1-3); R. canina (*pi*; 6-8) and vars.; R. centifolia (*pi-p*, *sc*; 3-6) and vars.; R. damascena (*w* or *r*, *sc*; 2-4) and

June (Hardy Perennials)—*continued.*

June (Hardy Shrubs)—*continued.*

vars.; R. gallica (*r*; 2-3); R. indica (*r*; 4-20); R. lucida (*r*; 1-2) and var.; R. lutea (*y*; 3) and var.; R. multiflora (*w*, *pi*, or *p*; 12) and vars.; R. rubiginosa (*pi*, *sc*; 5); R. rugosa (*r*; 4); R. sempervirens (*w*, *sc*) and vars.; R. sinica (*w*); R. spinosissima (*w* or *pi*; 1-4); Rubus australis (*pi* or *w*, *sc*); R. Chamæmorus (*w*; ¼-¾); R. laciniatus (*w* or *pi*); Salvia ringens (*r-p*; 1-2); Smilax rotundifolia (*g*); Solanum acanthodes (*b-p*; 3-6); Staphylea colchica (*w*; 3-5); S. pinnata (*w*; 6-12); Stuartia pentagyna (*c*; 10); Symphoricarpus occidentalis (*pi-w*); Tamarix parviflora (*pi*); Tecoma radicans (*r*; 25); Veronica carnosula (*w*); V. Lyallii (*w* and *pi*); V. pinguifolia (*w*; ¼-4); V. Traversii (*w*; 2½); Viburnum dentatum (*w* or *pi*; 5-10); V. dilatatum (*w* or *pi*; 10); V. macrocephalum (*w* or *pi*; 20); V. Opulus (*w*; 6-8); Wistaria chinensis (*b*); Yucca filamentosa (*g-w*; 4-8) and vars.; Zenobia speciosa (*w*; 2-4).

Half-hardy.—Annuals.—Ageratum mexicanum (*b*; 2); Calandrinia grandiflora (*pi*; 1); C. Menziesii (*p-r*; ½); C. umbellata (*m-r*; ½); Grammatocarpus volubilis (*y*); Maurandya Barclayana (*v-p* and *g*); Mentzelia bartonioides (*g-y*); Nicotiana acutiflora (*w*; 1-2); N. suaveolens (*w*, *sc*; 1-2); N. Tabacum (*pi*; 4); Portulaca grandiflora (*y-p*; ½); Salpiglossis sinuata (*p* and *y*; 2) and vars.; Schizanthus Grahami (*l* or *pi*, and *y*; 2); Schizopetalon Walkeri (*w*; 1-2); Zinnia elegans and vars.

Biennials.—Anarrhinum bellidifolium (*w* or *b*; 2); Anchusa capensis (*b*; 1½); Mathiola incana (*p*; 1-2).

Perennials.—Adlumia cirrhosa (*pi*; 15); Alströmeria Pelegrina (*w* or *y*, striped *pi*; 1); Anarrhinum bellidifolium (*w* or *b*; 2); Anigozanthus coccineus (*r*; 5); Arctotis acaulis (*y* and *r*; ½); Calceolaria arachnoidea (*p*; 1); C. Fothergillii (*y*, spotted *r*; ½-½); Centaurea ragusina (*y*; 2); Commelina cœlestis (*b*; 1½); Conandron ramondioides (*w*, or *pi* and *p*; ½); Crocosmia aurea (*o-r*; 2); Erodium Reichardi (*w* and *pi*; ¼); Ferraria Ferrariola (*g-br*); Hedychium Gardnerianum (*g-y*, *sc*; 3-5); Heteranthera limosa (*aq*, *v-b*); Lilium giganteum (*w*; 4-10); L. japonicum (*w*; 1-2); Linum flavum (*y*; 1-1½); L. Macraei (*o*; 1); Lobelia fulgens (*r*; 1-2); L. splendens (*r*; 1-2); Maurandya scandens (*p-v*); Mazus pumilio (*v*); Moræa unguiculata (*w* and *p-r*; 1); Myosotis azorica (*p*, becoming *b*; ½-¾); Neja gracilis (*y*; 1); Nierembergia gracilis (*w*, *p*, and *y*; ½-1); Ophiopogon japonicus (*w*); Romneya Coulteri (*w*; 2-4); Scilla chinensis (*pi-p*; 1); Sisyrinchium iridifolium (*y-w*; ¼-1); Tigridia pavonia (*o*; 1-2); Tropæolum tricolorum (*o-r*, tipped *bk* and *o*); Verbena venosa (*l* or *p*; 2).

Shrubs.—Calceolaria hyssopifolia (*y*; 1-2); C. scabiosæfolia (*y*); C. violacea (*v*, spotted; 2); Camellia japonica (variable; 20) and vars.; Cassia corymbosa (*y*; 6-10); Ceanothus integerrimus (*w*; 3-6); C. rigidus (*p-b*; 5-6); Ceratiola ericoides (*br*); Cistus albidus (*p* and *y*; 2); C. crispus (*r-p*; 2); C. heterophyllus (*r* and *y*; 2); C. hirsutus (*w*, marked *y*; 2); C. ladaniferus (*w*; 4) and var.; C. longifolius (*w*, marked *y*; 4); C. monspeliensis florentinus (*w* and *y*; 3); C. oblongifolius (*w*, spotted *y*; 4); C. obtusifolius (*w*, spotted *y*; 1-1½); C. psilosepalus (*w*, marked *y*; 2-3); C. purpureus (*r-p*; 2); C. rotundifolius (*p*, marked *y*; 1); C. vaginatus (*pi*; 2); C. villosus (*r-p*; 3); Clematis montana (*w*; 20); Cneorum pulverulentum (*y*; 1-3); Coronilla glauca (*y*, *sc* by day; 2-4); C. minima (*y*, *sc*; ½); Embothrium coccineum (*o-r*; 3); Escallonia macrantha (*r*; 3-6); Fuchsia macrostema globosa (*p-v* and *p-r*; 5-6); F. m. gracilis (*p* and *r*; 6-10); Gaylussacia frondosa (*g-p*; 3-6); G. resinosa (*r*; 1-3); Grindelia glutinosa (*y*; 2); Hudsonia ericoides (*y*; 1); Hydrangea quercifolia (*w*; 4-6); Hypericum empetrifolium (*y*; ½-1); H. Hookerianum (*y*; 2); Illicium anisatum (*y-w*; 4); I. floridanum (*r*; 8); Leycesteria formosa (*w* and *p*; 4-6); Linum arboreum (*y*; 1); Mitraria coccinea (*r*); Olearia dentata (*pi-w*); Ononis arragonensis (*y*; 1-2); Othonnopsis cheirifolia (*y*; ¾-1); Pentstemon cordifolius (*r*); Photinia serrulata (*w*; 10-20); Phygelius capensis (*r*; 3); Pittosporum undulatum (*w*; 10); Rhododendron Dalhousiæ (*w* or *pi-w*; 6-8); R. lepidotum (*y* or *r*; 2-4); R. Maddeni (*w*; 6-8); Salvia oppositiflora (*r*; 2); Sutherlandia frutescens (*r*; 3); Tecoma australis (*y-w*, tinged *p* or *r*); Veronica Hulkeana (*l*; 1-3); Yucca Whipplei violacea (*v*; 4-12); Zauschneria californica (*r*; 1).

Tender.—Annuals. — Begonia humilis (*i-h*, *w*; 1); Browallia demissa (*c-h*, *b*, *r*, or *p*; ½-1); B. Jamesoni (*c-h*, *o*; 4); Heliotropium indicum (*st*, *b*; 1); Impatiens Balsamina (*st*, *r*; 1-2); Martynia fragrans (*c-h*, *r-p* and *y*, *sc*; 2); Waitzia aurea (*c-h*, *o-y*; 1-2); W. nivea (*c-h*, *w*, *pi*, or *y*; 1½).

Biennial.—Cleome rosea (*pi*; 1½).

Perennials.—Acanthophippium bicolor (*st*, *p* and *y*; ¾); A. Curtisii (*st*, *pi* and *p*; ¾); Achimenes grandiflora (*i-h*, *v-p*; 1½); Actinotus helianthi (*c-h*, *w*; 2); Æchmea discolor (*st*, *r*; 2); Æ. Mariæ Reginæ (*st*, *b*; 2); Aerides cylindricum (*st*, *w* and *pi*; 1); Æschynomene sensitiva (*st*, *w*; 3-6); Agalmyla staminea (*st*, *r*; 2); Agapanthus umbellatus (*c-h*, *b*; 2-3); Albuca aurea (*c-h*, *y*; 2); A. Nelsoni (*c-h*, *w*, striped *r*; 4-5); Allamanda Aubletii (*st*, *y*; 10); A. cathartica (*st*, *y*); A. chelsoni (*st*, *y*); A. grandiflora (*st*, *y*; 12); A. neriifolia (*st*, *y*); Anchomanes Hookeri (*st*, *w*; 3); Antholyza caffra (*c-h*, *r*; 2); A. Cunonia (*c-h*, *r* and *bk*; 2); Arisæma concinna (*c-h*, *w*, and *g* or *p*; 1-2); Arthropodium pendulum (*c-h*, *w*; 1½); Babiana disticha (*c-h*, *b*, *sc*; ½); B. plicata (*c-h*, *v-b*, *sc*; ½); B. ringens (*c-h*, *r*; ½-¾); Bæa hygrometrica (*c-h*, *b*; ½); Batatas paniculata (*i-h*, *p*); Begonia acutiloba (*i-h*, *w*); B. amabilis (*i-h*, *pi* or *w*; ¾); B. amœna (*i-h*, *pi*; ¼); B. boliviensis (*i-h*, *r*; 2); B. Bruantii (*i-h*, *w* or *p*); B. Chelsoni (*i-h*, *o-r*; 2); B. Clarkii (*i-h*, *r*); B. coriacea (*i-h*, *pi*; ¾); B. Davisii (*i-h*, *r*; ½); B. Dregii (*i-h*, *w*; 1); B. echinosepala (*i-h*, *w*; 1½); B. eximia (*i-h*, *p* and *r*); B. geranifolia (*i-h*, *r* and *w*; 1); B. geranioides (*i-h*, *w*; 1½); B. hydrocotylifolia (*i-h*, *pi*; ½); B. imperialis (*i-h*, *w*; 3); B. malabarica (*i-h*, *pi*; 2); B. maxima (*i-h*, *w*); B. monoptera (*i-h*, *w*; 1-2); B. Pearcei (*i-h*, *y*; 1); B. prismatocarpa (*st*, *o* and *y*; 3); B. Richardsiana (*i-h*, *w*; 1); B. rosæflora (*i-h*, *pi*); B. rubricaulis (*i-h*, *w* and *pi*; 1); B. rubro-venia (*i-h*, *w*; 1-1½); B. strigillosa (*i-h*, *pi*; ¾); B. Sutherlandi (*i-h*, *o-r*; 1-2); B. Thwaitesii (*st*, *w*; ½); B. Veitchii (*i-h*, *r*; 1); B. xanthina (*i-h*, *y*; 1); Bifrenaria Hadwenii bella (*st*, *y*; 1½); Blandfordia aurea (*st*, *o-y*; 1-2); B. Cunninghamii (*st*, *br-r* and *y*; 3); B. flammea (*st*, *y*; 2) and vars.; Boucerosia maroccana (*c-h*, *r-p* and *y*; ½); Brassia Lawrenceana (*i-h*, *y*, spotted *br* and *g*; 1); B. maculata (*i-h*, *y*, spotted *br* and *y*; 1); B. verrucosa (*i-h*, *g*, spotted *bk-p* and *w*); Bromheadia palustris (*st*, *w*, streaked *p*; 2); Broughtonia sanguinea (*st*, *p-r*; 1½); Brunsvigia Cooperi (*c-h*, *y*, edged *r*; 1½); B. Josephineæ (*c-h*, *r*; 1½); B. multiflora (*c-h*, *r*; 1); Bulbophyllum Lobbi (*i-h*, *y*); Burbidgea nitida (*st*, *o-r*; 2-4); Calanthe Masuca (*i-h*, *v* and *v-p*; 3-4); C. veratrifolia (*i-h*, *w*; 2-3); Calochilus paludosus (*c-h*, *g* and *br*; ¾); Campanea grandiflora (*st*, *w* and *r*; 2); Canistrum aurantiacum (*st*, *o-y*); Canna Annæi (*st*, salmon; 6) and vars.; C. indica (*st*, *y* and *r*; 3-6); Catasetum callosum (*st*, *br-y*; 1); Cattleya citrina (*i-h*, *y*, *sc*; ½-¾); C. intermedia (*i-h*, variable; 1); C. Mossiæ (*i-h*, *pi*, &c; 1) and vars.; C. superba (*st*, *pi* and *r*; ¾); C. Wageneri (*i-h*, *w* and *y*); Centrosolenia picta (*st*, *w*; 1); Ceropegia Sandersoni (*c-h*, *g*, veined); Chironia floribunda (*c h*, *p*; 2); Chysis aurea (*st*, *y* and *r*) and vars.; C. lævis (*st*, *y* and *o*, blotched *r*); Cineraria cruenta (*c-h*, *r-p*; 2) and vars.; Cirrhopetalum Medusæ (*st*, straw, dotted *pi*); C. Thouarsii (*st*, *o* and *y*, dotted *r*); Cœlia Baueriana (*st*, *w*, *sc*; 1); Cœlogyne asperata (*st*, *c*, *br*, and *y*; 2); C. pandurata (*st*, *g* and *bk*, *sc*; 1½); C. Schilleriana (*i-h*, *y* and *p*; ½); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); C. viscosa (*i-h*, *w* and *br*; 1); Convolvulus mauritanicus (*c-h*, *b* and *w*); Crassula Bolusii (*c-h*, *pi-w*; ½-½); Crinum amabile (*st*, *r*, *sc*); C. cruentum (*st*, *r*); C. giganteum (*st*, *w*, *sc*); C. purpurascens (*st*, *p-r*); Cycnoches barbatum (*st*, *g-w* and *pi*); C. chlorochilum (*st*, *y-g*, *sc*; 2);

June (Tender Perennials)—*continued.*

Cypripedium barbatum (*st, p* and *w*; 1) and vars.; C. Dayanum (*st, w, p,* and *g*); C. Hookeræ (*st, y, br,* and *pi-p*); C. Parishii (*st, g-w* and *p*; 2); C. superbiens (*st, w* and *br*); Dendrobium albo-sanguineum (*st, w* and *r*); D. Bensoniæ (*c-h, w, o,* and *bk*); D. chrysotis (*st, y* and *p*); D. clavatum (*st, y* and *r*); D. crystallinum (*st, w, o, p,* and *pi*); D. erythroxanthum (*st, o* and *p*); D. formosum (*st, w* and *o*); D. infundibulum (*st, w*); D. longicornu majus (*st, w*); D. MacCarthiæ (*st, b* and *p*); D. moschatum (*st, w, y, pi,* and *bk-p*); D. Parishii (*st, p-pi, pi,* and *w*); D. suavissimum (*st, y* and *br-p, sc*); Dichorisandra leucophthalmus (*st, b-p* or *w*; 1-1½); D. thyrsiflora (*st, b*; 4); Disa grandiflora (*c-h, pi, r,* and *y*; 2-3) and var.; Drosera binata (*c-h, w*; ½); D. capensis (*c-h, p*; ½); Eichhornia crassipes (*st, v*); Epidendrum alatum majus (*c-h, y*); E. atropurpureum (*c-h, pi* and *p*; ½-1); E. bicornutum (*st, w* and *r*); E. falcatum (*st, g-y* and *y, sc*); E. prismatocarpum (*c-h, y-g, bk, p,* and *w*); Episcia villosa (*st, w* and *p*; 1-1½); Fragaria indica (*c-h, y*); Galaxia ovata (*c-h, y*); Galeandra Baueri lutea (*st, y* and *p*; ½); Gesnera discolor (*st, r*; 2); G. Donkelaariana (*st, r*; 1-2); G. nægelioides (*st, pi, r,* and *y*); Gladiolus blandus (*c-h, w* and *r*; ½-2); G. cuspidatus (*c-h,* variable; 2-3); G. psittacinus (*c-h, r, y, g,* and *p*; 3); Gloriosa superba (*st, o* and *r*; 6); Gloxinia maculata (*st, p-b*; 1); Goodyera macrantha (*c-h, pi*); Grammangis Huttoni (*st, br*); Grammatophyllum multiflorum (*st, g, br,* and *p*; 2); Griffinia dryades (*i-h, p-l* and *w*; 1½); G. hyacinthina (*i-h, b* and *w*); G. ornata (*i-h, b-l*; 1-1½); Guzmania tricolor (*st, w, y-g, bk-p,* and *r*); Hæmanthus puniceus (*c-h, o-r*; 1); Hedychium angustifolium (*st, r*; 3-6); Hesperantha radiata (*c-h, w*; ½); Hessea crispa (*c-h, pi*; ½); Hibiscus militaris (*c-h, pi*; 2-4); Hypoxis stellata (*c-h, w* and *b*; ½); Imantophyllum miniatum (*c-h, o*; 1-2); Impatiens Jerdoniæ (*st, y* and *r*; ¾); I. Sultani (*st, r*; 1); Ixia odorata (*c-h, y, sc*; 1); I. speciosa (*c-h, r*; ½); I. viridiflora (*c-h, g*; 1); Kæmpferia ornata (*st, y* and *o*); Kennedya prostrata (*c-h, r*); K. p. Marryattæ (*c-h, r*); Lælia anceps Warnerii (*i-h, pi* and *r*); L. majalis (*c-h, l, r-p,* and *w*); L. purpurata (*i-h, w* and *p-r*); L. p. Williamsii (*i-h, pi* and *r*); Limnocharis Plumieri (*i-h aq, y*; 1½); Littonia modesta (*c-h, o*; 2-6); Lobelia Erinus (*c-h, b,* and *w* or *y*; ½); Lotus jacobæus (*c-h, p* and *y*; 1-3); Lycaste cristata (*i-h, w* and *p*); Lycoris Sewerzowi (*c-h, br-r, sc*; 1); Mammillaria clava (*c-h, y, g,* and *r*; 1); Manulea rubra (*c-h, y*; 1-2); Marica cærulea (*st, b, y, br,* and *o*; 2); M. gracilis (*i-h, w* or *b,* and *r-br*; 2); M. Northiana (*st, w, y, r,* and *b*; 4); Miltonia cuneata (*i-h, br, w, y-g,* and *pi*; 1); M. flavescens (*i-h, y* and *r*); Mimosa pudica (*st, r*; 1); Mirabilis Jalapa (*c-h,* variable, *sc*; 2); Moltkia petræa (*c-h, pi-p,* becoming *v-b*; ½-¾); Musschia aurea (*c-h, y*; 1-2); Nelumbium speciosum (*c-h aq, w, sc*); Nerine sarniensis venusta (*c-h, r*); Nymphæa Devoniensis (*st aq, pi-r*); N. gigantea (*i-h aq, b*); N. Lotus (*st aq, r* or *w*); N. scutifolia (*i-h aq, b, sc*); N. stellata (*st aq, b, sc*); N. s. zanzibarensis (*st aq, b*); N. thermalis (*st aq, w*); Odontoglossum crispum (*c-h, w, y,* and *r-br*); O. hastilabium (*c-h, c-w, br,* and *w, sc*); O. maxillare (*i-h, w, o,* and *p-br*); Oncidium ampliatum (*st, y*); O. annulare (*i-h, br* and *y*); O. barbatum (*st, y* and *br*); O. Cebolleta (*st, y-r*); O. concolor (*i-h, y*); O. cornigerum (*i-h, y* and *r*); O. cucullatum (*c-h, br-p* and *pi-p*); O. divaricatum (*i-h, y* and *br*); O. macranthum (*i-h, y* and *p-br*); O. Wentworthianum (*c-h, g-y* and *br*); Ornithogalum thyrsoides (*c-h, y*; ½-1½); Ottelia ovalifolia (*st aq, g* and *y*); Oxalis lasiandra (*c-h, r*; ¾-1½); Pelargonium Bowkeri (*c-h, p* and *y*; 1); P. fissum (*c-h, pi*; 1); P. glauciifolium (*c-h, bk-p,* edged *g-y, sc*); P. oblongatum (*c-h, p-c*; ½); Pelecyphora aselliformis (*c-h, w* and *pi*; ¼); Phaius Marshalliæ (*st, w* and *y*; 2); Phalænopsis Aphrodite (*st, w, r, o,* and *y*); Pilea microphylla (*st, g*; ½); Pitcairnia Karwinskiana (*st, r*); P. xanthocalyx (*st, y*); Plagiolirion Horsmanni (*st, w*); Ranunculus Lyalli (*c-h, w*; 2-4); Renanthera coccinea (*i-h, p-r*); Rhoeo discolor (*st, b* or *p*); Richardia africana (*c-h, w*; 2); R. albo-maculata (*c-h, g-w*; 2); R. melanoleuca *c-h, w* and *p*; 1½); Rivina humilis (*st, w-pi*; 1-2); R. lævis (*st, w-pi*; 7-8); Saccolabium curvifolium (*st, r*; ½-1); S. rubrum (*st, pi*; ¾); S. Turneri (*st, l*); Salvia cacaliæfolia (*c-h, b*; 3); S. ianthina (*c-h, v-p*; 2); Scutellaria costaricana (*st, p* and *r*; 1½-3); Senecio pyramidalis (*c-h. y*; 2); Sinningia concinna (*st, p* and *y*); S. conspicua (*st, y* and *p*; 1); S. Youngiana (*st, v* or *p*; 1-1½); Siphocampylos Humboldtianus (*st, r*; 3); Sobralia macrantha (*st, p* and *r, sc*; 6-8); Solanum sisymbriifolium (*c-h, b* or *w*; 4); Sonchus gummifer (*c-h, y*; 2-3); Sonerila Bensoni (*st, pi-p*); S. margaritacea (*st, pi*) and var.; Sparaxis pendula (*c-h, l*; 4); Spiranthes cinnabarina (*st, y-pi*; 2-3); Sprekelia formosissima (*c-h, r* or *w*; 2); Stachys coccinea (*c-h, r*; 1-2); Stapelia Asterias (*c-h, v, y,* and *p*; ½); Streptocarpus Dunnii (*i-h, r-pi*; 1); S. parviflora (*c-h, w* and *p*); S. Rexii (*st, b*; ½); S. Sandersii (*st, b*; 1); Stylidium spathulatum (*c-h, y*; ½); Tacca integrifolia (*st, g, p,* and *y*); T. pinnatifida (*st, p*); Talauma pumila (*st, c, sc*; 2-4); Thunbergia erecta (*st, b, o,* and *y*; 6) and var.; Thysanotus tuberosus (*c-h, p*); Torenia asiatica (*st, b* and *v*); T. flava (*st, y* and *p*; ½-¾); T. Fournieri (*st, v, l,* and *y*; ½-¾); Trichinium Manglesii (*c-h, w* or *p*; ½-1); Trichopilia crispa (*c-h, p, w,* and *r*); T. marginata (*c-h,* variable); Tritonia crocata (*c-h, y*; 2); Tropæolum Jarrattii (*c-h, o-r, y,* and *b*); T. peregrinum (*c-h, y*); Turnera ulmifolia (*st, y*; 2-4); Vanda insignis (*st, br, y-w, w,* and *pi-p*); V. Parishii (*st, g-y, m, w,* &c., *sc*); V. Roxburghii (*st g, v-p,* and *w*); V. teres (*st, w, pi-m,* &c.); Vinca rosea (*i-h, pi* or *w*); Wahlenbergia tuberosa (*c-h, w* and *pi*; ½-2); Warrea tricolor (*st, y, p,* and *w*); Watsonia densiflora (*c-h, pi*; 1½-2); Zebrina pendula (*i-h, w* and *pi-p*); Zygopetalum cœleste (*c-h, b, p, m,* &c.; 1¼-1½).

SHRUBS.—Acacia pulchella (*c-h, y*; 2-3); A. vestita (*c-h, y*; 4); Acæna microphylla (*c-h, g*; ¼); Acmadenia tetragona (*c-h, w*; 1-2); Acmena floribunda (*c-h, w*; 4); Acrophyllum venosum (*c-h, pi-w*; 6); Actinocarpus minor (*c-h aq, w*; ½); Adamia cyanea (*c-h, w* or *pi*; 6); A. sylvatica (*c-h, b*; 6); Adenandra amœna (*c-h, w* and *r*; 1-2); A. marginata (*c-h, pi-w*; 1-2); A. umbellata (*c-h, pi*; 1-2); A. uniflora (*c-h, w* and *pi*; 1-2); A. villosa (*c-h, pi*; 1-2); Adenanthos barbigera (*c-h, r*; 7); Adesmia microphylla (*c-h, y*; 1-2); Æschynanthus cordifolius (*st, r,* striped *bk,* and *o*; 1); Æ. Lobbianus (*st, r*; 1); Æ. longiflorus (*st, r*; 2); Æ. miniatus (*st, r*; 1½); Æ. pulcher (*st, r*; 1); Æ. speciosus (*st, o*; 2); Æ. splendidus (*st, r,* spotted *bk*; 1); Alonsoa incisifolia (*c-h, r*; 1-2); Amphilophium paniculatum (*st, pi*; 6); Anthospermum æthiopicum (*c-h, w*; 2-3); Ardisia crenulata (*st, r-v*; 3-6); A. japonica (*st, w* and *r*; 1); Argyreia cymosa (*st, pi*; 10); Artabotrys odoratissimus (*st, r-br, sc*; 6); Asystasia macrophylla (*st, pi-p*; 8-20); Babingtonia Camphorasmæ (*c-h, pi-w*; 7); Barleria flava (*st, y*; 3); Barosma serratifolia (*c-h, w*; 1-3); Bauhinia corymbosa (*st, pi*); B. variegata (*st, r, w,* and *y*; 20); Beaumontia grandiflora (*st, w*); Befaria glauca (*c-h, pi-w*; 3-6); Begonia cinnabarina (*st, r*; 2); B. coccinea (*st, r*; 2); B. Evansiana (*c-h, pi*; 2); B. falcifolia (*st, r*; 1-2); B. foliosa (*st, w,* tinged *pi*); B. fuchsioides (*st, r*); B. Ingramii (*c-h, pi*; 2); B. Kunthiana (*st, w*); B. maculata (*st,* variable); B. nitida (*st, pi*; 4-5); B. platanifolia (*st, pi-w*; 5-6); Berzelia lanuginosa (*c-h, w*; 1-2); Bignonia Cherere (*i-h, o*; 10); B. magnifica (*i-h, m,* or *p-r*); B. variabilis (*i-h, g-y*; 10); Billardiera longiflora (*c-h, g-y,* turning *p*); B. scandens (*c-h, c,* turning *p*; 10); Boronia Drummondi (*c-h, pi*; 2); Bougainvillea glabra (*c-h, pi*); B. speciosa (*c-h, l*); Brunfelsia americana (*st, y,* turning *w, sc*; 4-6); B. eximia (*st, p, sc*; 2½); Canavalia ensiformis (*st, w* and *r*); Capparis odoratissima (*st, v, sc*; 6); Cassinia denticulata (*c-h, y*; 6-8); Catesbæa latifolia (*st*; 4-5); Celastrus lucidus (*c-h, w*; 1-3); Cephaelis tomentosa (*st, br*; 4); Cereus grandiflorus (*st, y, br,* and *w*); Cestrum elegans (*c-h, p-r*); Chloanthes stœchadis (*c-h, g-y*; 2); Chorizema diversifolium (*c-h, o-r*; 2); C. Henchmannii (*c-h, r*; 2); C. ilicifolium (*c-h, y*; 3) and var.; C. varium (*c-h, y* or *r*; 4); Chrysocoma Coma-aurea (*c-h,*

June (Tender Perennials)—*continued.*

June (Tender Shrubs)—*continued.*

y; 2); Cleome gigantea (*st, w-g*, 6-12); Clerodendron splendens (*st, r*; 6); C. s. speciosissima (*st, r*); C. squamatum (*st, r*; 10); Cobæa scandens (*c-h, p*; 20); Columnea aurantiaca (*st, o*; 1); Combretum grandiflorum (*st, r*); C. racemosum (*st, w*); Cotyledon coruscans (*c-h, o*; 1-2); Cowania plicata (*c-h, r*; 1-2); Crassula coccinea (*c-h, r*; 1-3); C. falcata (*c-h, r* or *w*; 3-8); C. versicolor (*c-h, r* and *w*); Crotalaria Cunninghamii (*c-h, y-g* and *p*; 3); Crowea saligna (*c-h, pi*; 1-2); Cytisus canariensis (*c-h, y*); Daphne indica (*c-h, r* or *w*; 4); Darwinia fimbriata (*c-k, pi*; 1-2); D. macrostegia (*c-h, w, y*, and *r*; 2-3); Diosma ericoides (*c-h, w* and *r*; 1-3); Dipladenia amabilis (*st, pi-r*; 10); D. boliviensis (*st, w* and *y*); Discaria serratifolia (*c-h, g-w, sc*; 6-10); Doryanthes excelsa (*c-h, r*; 8-16); Dracophyllum capitatum (*c-h, w*; 1-1½); D. gracile (*c-h, w, sc*); Drosophyllum lusitanicum (*c-h, y*); Duvalia polita (*c-h, br-p, br* or *r*, and *o*); Echium fastuosum (*c-h, b*; 2-4); Elæocarpus grandiflora (*st, y, r*, and *w*; 7); Enkianthus himalaicus (*c-h, y-r* and *r*; 20); E. quinqueflorus (*c-h, r* and *pi-w*; 3-10); Epacris longiflora (*c-h, r* and *w*; 2-4); Erica Aitonia (*c-h, r* or *w*; 2); E. Beaumontiana (*c-h, w* and *p*; 1); E. Bergiana (*c-h, p*; 1½); E. Candolleana (*c-h, pi-r* and *w*); E. Cavendishiana (*c-h, y*; 1½); E. cerinthoides (*c-h, r*; 3); E. colorans (*c-h, r*, varying to *w*; 2); E. Devoniana (*c-h, p*); E. elegans (*c-h, pi* and *g*; ½-1); E. eximia (*c-h, r* and *g*; 2); E. Fairieana (*c-h, pi* and *w*); E. grandiflora (*c-h, y*; 3); E. hybrida (*c-h, r*); E. Irbyana (*c-h, w* and *r*; 1-2); E. jasminiflora (*c-h, r*; 1-2); E. Lambertiana (*c-h, w*; 1-2); E. McNabiana (*c-h, pi-r* and *w*); E. odorata (*c-h, w, sc*; 1); E. Parmentieriana (*c-h, r-p*; 1); E. primuloides (*c-h, pi-p*; 1); E. Savileana (*c-h, r* or *p-r*; 1); E. Shannoniana (*c-h, w* and *p*; 1-2); E. tricolor (*c-h, r, w*, and *g-y*; 2); E. Victoria (*c-h, p* and *w*); E. Westphalingia (*c-h, pi-r*); Eriostemon buxifolius (*c-h, pi*; 1-2); E. scaber (*c-h, w* and *pi*; 1½); Fuchsia corymbiflora (*c-h, r*; 4-6); F. dependens (*c-h, r*; 2-4); F. fulgens (*c-h, r*; 4-6); F. splendens (*c-h, r* and *g*; 6); F. thymifolia (*c-h, r*; 4-6); Gaultheria ferruginea (*c-h, pi*); Gomphocarpus fruticosus (*c-h, w*; 5-7); Gompholobium grandiflorum (*c-h, y*; 2); G. polymorphum (*c-h, r, y*, and *p*); G. venustum (*c-h, p*; 1-3); Goodia lotifolia (*c-h, y* and *r*; 2-4); G. pubescens (*c-h, y* and *r*; 1-3); Grevillea acanthifolia (*c-h, r*; 4); G. robusta (*c-h, o*; 5); G. rosmarinifolia (*c-h, r*; 4); Guettarda odorata (*st, r, sc* at night; 6-10); Gustavia insignis (*st, c-w* and *pi*; 3-4); Hakea cucullata (*c-h, r*; 4); H. nitida (*c-h, w*; 6-8); H. suaveolens (*c-h, w*; 4); Heliotropium corymbosum (*c-h, l*; 4); Hermannia flammea (*st, o* or *r*; 1-3); Hibbertia dentata (*c-h, y*); H. perfoliata (*c-h, y*); Hovea elliptica (*c-h, b*; 2-4); Hoya carnosa (*i-h, pi-w*); H. Cumingiana (*st, g-y* or *w*, and *p-br*); H. imperialis (*st, r-br*); H. pallida (*st, y* or *y-w*, and *pi, sc*); H. Shepherdi (*st, w* and *pi*; 3); Hypericum balearicum (*c-h, y*; 1-2); Hypocalyptus obcordatus (*c-h, p*; 1-2); Indigofera australis (*c-h, pi*; 3-4); Iochroma fuchsioides (*c-h, o-r*; 5); I. lanceolata (*c-h, p-b*; 4-5); Ixora chelsoni (*st, o-pi*); I. coccinea (*st, r*; 3-4); I. javanica (*st, o*; 3-4); Jasminum grandiflorum (*i-h, w*); J. Sambac (*st, w, sc*); Jatropha podagrica (*st, o-r*; 1½); Justicia ventricosa (*st, pi*; 3); Lachnæa buxifolia (*c-h, w*; 2); L. purpurea (*c-h, p*; 2); Lagerströmia indica (*st, pi*; 6-10); Leschenaultia biloba (*c-h, b*; 1); L. formosa (*c-h, r*; 1); Leucopogon verticillatus (*c-h, w* or *pi*; 3-6); Lippia citriodora (*c-h, w*; 3); Lonicera sempervirens (*c-h, r* and *y*); Luculia Pinceana (*c-h, w, sc*); Melianthus major (*c-h, br*; 4-6); Mesembryanthemum blandum (*c-h, w*, becoming *pi* or *r*; 1); M. candens (*c-h, w*); M. coccineum (*c-h, r*); M. densum (*c-h, pi*; ¼); M. inclaudens (*c-h, p-pi*; 1½); M. spectabile (*c-h, r*; 1); M. violaceum (*c-h, pi-w* to *v*; 1-2); Mimulus glutinosus (*c-h, br* or *pi*; 5); Myrsiphyllum asparagoides (*i-h, g* or *w*); Myrtus Luma (*c-h, w*; 3); Nerium Oleander (*c-h, r*; 6-14); Opuntia arborescens (*c-h, p*; 5); O. braziliensis (*c-h, g-y*; 10-30); O. echinocarpa (*c-h, g-y*); O. multiflora (*c-h, y*); O. vulgaris (*c-h, g-y*; 2); Oxylobium

June (Tender Shrubs)—*continued.*

Callistachys (*c-h, y*; 3-4); O. ellipticum (*c-h, y*; 2-3); Pachypodium succulentum (*st, r* and *w*); Passiflora alata (*st, r, p*, and *w, sc*); P. cæruleo-racemosa (*c-h, p*); P. coccinea (*st, r* and *o*); P. Hahnii (*c-h, w* and *y*); P. racemosa (*st, r*); Pelargonium ardens (*c-h, r*; 1-1½); P. comptum (*c-h, pi* and *p*); P. echinatum (*c-h, w* spotted *r*, or *p*; 1); P. fragrans (*c-h, w* and *r*; 2); P. ignescens (*c-h, r*; 1½); Pentarhaphia floribunda (*st, r*); P. libanensis (*st, r*; ¼); Pentas carnea (*st, pi-w*; 1½); Pergularia odoratissima (*st, g-y, sc*); Persoonia ferruginea (*c-h, y*; 2-3); P. rigida (*c-h, y*; 3-4); Petræa arborea (*st, v-b*; 12); Phænocoma prolifera (*c-h, r*; 4); Philesia buxifolia (*c-h, r*; 4); Phyllanthus Chantrieri (*st, r* and *y*); P. pallidifolius (*st, y* and *r*); Phyllocactus Ackermanni (*st, pi*); P. phyllanthoides (*st, pi* and *w*; 1-3); Pimelea rosea (*c-h, pi* or *w*; 2); Pitcairnia aphelandræflora (*st, r*); Pleroma elegans (*st, b*; 5); Plumbago capensis (*i-h, b*; 2); Podalyria calyptrata (*c-h, p*; 6); Podanthes geminata (*st, o-y* and *r-p*); Pomaderris apetala (*st, g*; 3-6); Portlandia platantha (*st, w*; 3); Prostanthera violacea (*c-h, b-p*; 4); Protea pulchella (*c-h, r*; 3); Psoralea aculeata (*c-h, b* and *w*; 2-3); P. pinnata (*c-h, b*; 3-6); Pultenæa stricta (*c-h, y*; 1-3); Quisqualis indica (*st*, variable); Rafnia triflora (*c-h, y*; 2-4); Randia macrantha (*st, y*; 9-30); Rhododendron campylocarpum (*c-h, y*; 6); R. Edgeworthii (*c-h, w, sc*); R. javanicum (*c-h, o* and *r*; 4); R. lanatum (*c-h, y-w* and *r*); R. Thomsoni (*c-h, r* and *g*; 6-10); Rhodomyrtus tomentosa (*c-h, pi*; 5); Rhus succedanea (*c-h, g-y*; 10-15); Rondeletia amœna (*st, pi* and *o-y*; 4); R. cordata (*st, pi*; 4); R. Purdiei (*st, y, sc*; 4); Ruellia macrophylla (*i-h, r*; 3-4); Salvia albo-cærulea (*c-h, w* and *b*; 3); S. Goudotii (*c-h, r*; 2); S. Grahami (*c-h, p-b*; 2); S. Heerii (*c-h, r*; 2-3); S. rutilans (*c-h, r*; 2-3); Sanchezia nobilis (*st, r* and *y*; 1-3) and var.; Sarmienta repens (*c-h, r*); Scutellaria Hartwegi (*st, r* and *v*; 1); S. Mociniana (*st, r* and *y*; 1½); Selago Gillii (*c-h, pi*; ½); Sempervivum canariense (*c-h, w*; ½); S. tabulæforme (*c-h, y*; 1); Senecio argenteus (*c-h, y*; 1-2); S. macroglossus (*c-h, y*); Solandra viridiflora (*st, g*; 2-3); Solanum atropurpureum (*c-h, p* and *y*); S. Capsicastrum (*c-h, w*; 1-2); S. giganteum (*c-h, b*; 10-25); S. jasminoides (*c-h, b-w*) and var.; S. marginatum (*c-h, w* and *p*; 3-4); S. maroniense (*st, b-v*; 6-14); S. Pseudo-capsicum (*c-h, w*; 4); S. pyracanthum (*c-h, b-v*; 3-6); S. Seaforthianum (*st, r* or *l*); Sophora secundiflora (*c-h, v*; 6); Sphæralcea miniata (*c-h, r*; 1); Stachytarpheta mutabilis (*st, r*; 3); Steriphoma cleomoides (*i-h, y*; 6); Streptosolen Jamesonii (*c-h, o*; 4); Strobilanthes anisophyllus (*st, l*; 2-3); Tabernæmontana Barteri (*st, w*; 6); Tacsonia insignis (*i-h, r, v-r*, and *w*); Talinum Arnotii (*c-h, y*); Teucrium fruticans (*c-h, b*; 2-3); Ursinia pulchra (*c-h, o*; 1); Vaccinium leucobotrys (*c-h, w*); Witsenia corymbosa (*c-h, p-b*); Xanthosia rotundifolia (*c-h, w*; 1-2); Yucca aloifolia (*c-h, w*; 15-20); Y. Treculeana (*c-h, w*; 20-25).

JULY.—Hardy.—ANNUALS.—Acroclinium roseum (*pi*; 1-2) and vars.; Agrostemma cœli-rosa (*pi, w*, or *p*; 1); Amarantus hypochondriacus (*r*; 4-5); A. speciosus (*r-p*; 3-5); Anagallis grandiflora (*b* and *r*; ¼); Androsace carnea (*pi*; ¼); A. lanuginosa (*pi*; ½-¾); A. Vitaliana (*y*; ¼); Argemone albiflora (*w*; 1); Bartonia albescens (*y*; 1-4); Bellium bellidioides (*w*; ¼); Blumenbachia insignis (*w* and *r-y*; 1); Brachycome iberidifolia (*b* or *w*; 1); Calendula maderensis (*o*; 2); C. officinalis (*o*; 3); Callistephus chinensis (*p*; 2); Campanula Erinus (*b-pi* or *w*; ¼-¾); Castilleja coccinea (*y* and *r*; 1); Centaurea Cyanus variable; 2-3); C. suaveolens (*y, sc*; 1½); Centranthus macrosiphon (*pi*; 2); Cerinthe major (*y* and *p*; 1); C. retorta (*y* and *v*; 1½); Chlora perfoliata (*y*; 1); Chrysanthemum coronarium (*y*; 4); C. segetum (*y*; 1½); Clarkia elegans (*r*; 2); C. pulchella (*p*; 1½-2); Collinsia grandiflora (*p* and *b*; 1); Collomia coccinea (*r*; 1-1½); C. grandiflora (*r-y*; 1½-2); Convolvulus tricolor (*y, b*, and *w*; 1); Coreopsis Drummondi (*y* and *r-br*; 1); Delphinium Ajacis

July (Hardy Annuals)—*continued.*

(*b*, *r*, or *w*; 1-1½); Downingia elegans (*b* and *w*; ½); D. pulchella (*b* and *y*; ½); Drosera rotundifolia (*w*; ¼); Erysimum Perofskianum (*r-o*; 1); Eschscholtzia californica (*y*; 1½); E. c. crocea (*o*; 1); Eucharidium concinnum (*l-p*; 1); Fedia Cornucopiæ (*r*; ½); Fumaria capreolata (*w* and *p*; 4); Gilia capitata (*b*; 1-2); G. liniflora (*w*; 1); G. micrantha (*pi*; ¾); Helianthus annuus (*y*; 6); Heliotropium convolvulaceum (*w*, *sc*; 2); Iberis coronaria (*w*; 1); I. umbellata (variable; ½-1); Ionopsidium acaule (*l*, or *w* and *v*; ¼); Ipomœa purpurea (*p*; 10); Lasthenia glabrata (*y*; ¾-1½); Lathyrus grandiflorus (*pi*); L. odoratus vars.; Lavatera trimestris (*pi*; 3-6); Limnanthes Douglasii (*y* and *w*, *sc*; ¾); Linaria reticulata (*p*, and *y* or *br*; 2-4); L. spartea (*y*); Linum grandiflorum (*pi*; ½-1); Loasa prostrata (*y*); L. vulcanica (*w*; 2); Lopezia coronata (*pi-p*; 1½); Lunaria annua (*v-l*; 1½-3); Lupinus luteus (*y*, *sc*; 1-1½); L. nanus (*l* and *b*; 1); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Malope trifida (*p* or *w*; 1); Mathiola annua (variable; 1-2); Mesembryanthemum crystallinum (*w*); Nemesia cynanchifolia (*l-b*; 1½-2); N. floribunda (*w* and *y*, *sc*; 1); Nemophila insignis (*b*; 1½); N. maculata (*w* and *v-p*; ½); N. Menziesii (*w* to *b*; ¼); Nicandra physaloides (*b*; 2); Nigella damascena (*w* or *b*; 1-2); N. hispanica (*b*; 1-2); N. orientalis (*y* and *r*; 1½); Nolana lanceolata (*b*, *w*, and *g*; ½); N. paradoxa (*v*); N. tenella (*b*); Nonnea rosea (*pi*; ½-1); Œnothera amœna (*pi* and *r*; 1-2); Œ. bistorta Veitchiana (*y* and *r*); Œ. Whitneyi (*pi-r* and *r*; 1-1½); Œ. varieties; Omphalodes linifolia (*w*; ½-1); Oxalis stricta (*y*; 1½); O. valdiviensis (*y* and *r*; ½-¾); Papaver alpinum (*y*; ½); P. nudicaule (*o*, *y*, or *w*; ¾-1½); P. orientale (*r*, spotted *p*; 2-3) and vars.; P. pilosum (*r* or *o*, and *w*; 1-2); P. Rhœas (*r*; 1) and vars.; P. somniferum (variable; 3-4); Phacelia viscida (*b* and *p*; 1); Podolepis aristata (*y* and *pi*; 1); Ranunculus anemonoides (*pi-w*; ¼-½); R. parnassifolius (*w* or *p-w*; ¼-½); Reseda odorata (*y-w*, *sc*) and vars.; Sabbatia calycosa (*w*; ½-1¾); S. campestris (*pi*; 1); Salvia coccinea (*r*; 2); Saponaria calabrica (*p*; ½-1); Scabiosa atropurpurea (*r*, *sc*; 2-3); Schizanthus pinnatus (variable; 2); Sedum cœruleum (*b*; ¼); S. sempervivoides (*r*; ¼-¾); Silene Atocion (*pi*; ½-1); S. pendula (*pi-w*); Sonchus gummifer (*y*; 2-3); Statice Suworowi (*l*); Tagetes erecta (*y*; 2); Tropæolum peregrinum (*y*); Vesicaria grandiflora (*y*; 1); Wahlenbergia hederacea (*b*); Xeranthemum annuum (*p*; 2).

BIENNIALS.—Anagallis fruticosa (*r*; 2); Bartonia albescens (*y*; 1-4); Campanula Medium (*b*, *p*, and *w*; 1-4); Dianthus chinensis (variable; ½-1); Digitalis purpurea (*p*, varying to *w*; 3-5); Glaucium flavum (*y*; 1-2); Grindelia grandiflora (*y* or *o*; 2½-3); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Lunaria annua (*v-l*; 1½-3); Œnothera biennis (*y*, *sc*; 2-4); Sedum cœruleum (*b*; ¼); S. sempervivoides (*r*; ¼-¾); Silybum Marianum (*pi-p*; 1-4); Stachys germanica (*pi* and *w*; 1-3); Tragopogon glaber (*p*; 1½).

PERENNIALS.—Acantholimon glumaceum (*pi*; ½); A. venustum (*pi*; ½-¾); Acanthus mollis (*w*; 3-4); A. spinosus (*pi*; 3-4); Achillea ægyptiaca (*y*; 1½-2½); A. Ageratum (*w*; ½); A. asplenifolia (*pi*; 1½); A. aurea (*y*; 1½); A. Clavennæ (*w*; ¾); A. Eupatorium (*y*; 4-5); Aconitum Anthora (*y*; 1-2) and vars.; A. autumnale (*b-p*; 3-4); A. barbatum (*c*; 2-6); A. chinense (*b*; 4-6); A. japonicum (*pi-w*; 6); A. lycoctonum (*v*; 4-6); A. Napellus (*b*; 3-4); A. ochroleucum (*c*; 4-6); A. Ottonianum (*b* and *w*; 2-4); A. paniculatum (*v*; 2-3); A. uncinatum (*l*; 4-8); A. variegatum (*b*; 1-6) and vars.; A. vulparia (*y*; 1-3) and vars.; Acorus Calamus (*y*; 3); Actinella grandiflora (*y*; ½-¾); Actinomeris helianthoides (*y*; 3); A. squarrosa (*y*; 3); Adenophora coronopifolia (*b*; 1-2); A. denticulata (*b*; 1½); A. Gmelini (*b*; 1-2); A. pereskiæfolia (*b*; 1½); Adonis pyrenaica (*y*; 1-1½); Agrostemma coronaria (*w*; 1-2); A. flos-Jovis (*p* or *r*; 1½); Ajuga australis (*b*; ½); Aletris aurea (*y*; 1-2); Alisma natans (*aq*, *w*; ¼); A. Plantago (*pi*; 3); Allium acuminatum (*pi*;

July (Hardy Perennials)—*continued.*

½-1); A. azureum (*b*; 1-2); A. Bidwelliæ (*pi*; ¼); A. Breweri (*pi*; ¼); A. nigrum (*v* or *w*; 2½-3¼); A. pedemontanum (*pi-p*; 1); Alströmeria aurantiaca (*o*; 3-4); A. chilensis (*p-r* or *pi*; 2-3); A. versicolor (*y* and *p*; 2-4); Althæa rosea (*pi*; 8) and vars.; Alyssum Wiersbeckii (*y*; 1½); Amsonia salicifolia (*b*; 1½-2½); A. Tabernæmontana (*b*; 1½-2½); Anagallis linifolia (*b*; ¾-1) and vars.; A. tenella (*pi*; ¼); Anemonopsis macrophylla (*p* and *l*; 2-3); Anomatheca cruenta (*r*; ½-1); Anthemis Aizoon (*w* and *y*; ¼); A. Biebersteinii (*y*; 1-2); Anthericum Liliago (*w*; 1-1½); A. Liliastrum (*w*; 1-2); Anthyllis Vulneraria (*y*, *w*, *r*, or *pi*); Antirrhinum molle (*p*, *w*, and *y*; 1); Apios tuberosa (*br-p*, *sc*; ½); Apocynum androsæmifolium (*r*; 1-2); Aquilegia Bertoloni (*b-v*; 1); A. cærulea (*b* and *w*, or *w*; ¾-1½); A. californica (*y* and *o-r*; 2-4); A. chrysantha (*y* and *p*; 3-4); A. formosa (*r* and *y*; 2-4); A. fragrans (*w* or *p-r*, *sc*; 1½-2); A. pyrenaica (*l-b*; ¾-1); A. sibirica (*l*; 1); Arabis arenosa (*pi*, *w*, or *b*; ½); A. lucida (*w*; ¼-½) and vars.; A. rosea (*pi-p*; 1); Arenaria balearica (*w*; ¼); A. rotundifolia (*w*; ¼-½); Argemone grandiflora (*w* and *y*; 2-3); Arisæma triphylla (*p-b* and *g*; ¾-1); Aristolochia Clematitis (*y*; 2); Arnica Chamissonis (*y*; 1-2); A. montana (*y*; 1); A. scorpioides (*y*; ½-1); Artemisia alpina (*y*; ½-¾); A. argentea (*y*; 1½); A. Dracunculus (*w-g*; 2); A. Mutellina (*y-g*; ½); A. Stelleriana (*y*; 1-2); A. tanacetifolia (*br*; 1½); Asarum caudatum (*br-r*; 1); Asclepias acuminata (*r* and *w*; 2); A. amœna (*p*; 2-3); A. incarnata (*r* or *p*; 2); A. tuberosa (*o*; 1-2); Ascyrum Crux-Andreæ (*y*; 1); Asperula longiflora (*w*, *y*, and *r*; ½); A. montana (*pi*; ½-¾); A. orientalis (*b*; 1); Asphodelus creticus (*y*); Aster æstivus (*b*; 2); A. alpinus (*p*; ½-¾); A. altaicus (*b-p*; 1); A. Bigelovii (*l* and *y*; 2½); A. caucasicus (*p*; 1); A. peregrinus (*b-p*; 1); A. pyrenæus (*l-b* and *y*; 1-1½); A. salsuginosus (*v-p*; ¾-1½); Astilbe rivularis (*y-w* or *r*; 3); Astragalus leucophyllus (*y*; 2-3); A. onobrychioides (*p*; ¾-1); A. pannosus (*pi*; ½-¾); A. sulcatus (*v* and *w*; 2-3); Bellium minutum (*w* and *y*; ¼); Bessera elegans (*r*, or *r* and *w*; 2); Bocconia cordata (buff; 5-8); Borago laxiflora (*b*); B. officinalis (*b*; 1-2); Bravoa geminiflora (*o-r*; 2); Brodiæa congesta (*b*; 1); B. gracilis (*y*; ½); B. grandiflora (*b-p*; 1½); B. Howelli (*p-b*; 1½-2); B. lactea (*w* and *g*; 1-2); Buphthalmum speciosissimum (*y*; 2); Butomus umbellatus (*aq*, *pi*); Callirhoe digitata (*r-p*; 2-3); C. involucrata (*r*; ½); C. Papaver (*v-r*; 3); Calochortus albus (*w*, blotched *r*; 1-1½); C. Benthami (*y*; ½-¾); C. cœruleus (*l*, dotted *b*; ¼-½); C. lilacinus (*pi*; ½-¾); Calopogon pulchellus (*p* and *y*; 1½); Calypso borealis (*pi*, *br*, and *y*; 1); Calystegia dahurica (*pi-p*; ¼); Camassia esculenta (*b*; 1); Campanula Adami (*b*; ½); C. Allionii (*b* or *w*; ¼); C. alpina (*b*; ¼-½); C. bononiensis (*b-v* or *w*; 2-3); C. cæspitosa (*b* or *w*; ¼-½); C. carpathica (*b* or *w*; ¾) and vars.; C. collina (*b*; 1); C. Elatines (*b-p*; ¼-½); C. fragilis (*l-p* and *w*; ¼-½); C. garganica (*b*; ¼-½); C. glomerata (*b-v* or *w*; 1-2) and vars.; C. lactiflora (*b-w* or *b*; 2-6); C. latifolia (*b* or *w*; 1-2) and vars.; C. nitida (*b* or *w*; ¼-¾); C. nobilis (*r-v*, *w*, or *c*, spotted; ¼-¾); C. peregrina (*v*; 2); C. persicæfolia (*b* or *w*; 1-3) and vars.; C. Portenschlagiana (*b-p*; ½-¾); C. pusilla (*b* and *w*, or *w*; ¼-½); C. pyramidalis (*b* or *w*; 4-5) and vars.; C. Rapunculus (*b* or *w*; 2-3); C. rotundifolia (*b*; ½-1) and vars.; C. sarmatica (*b*; 1-2); C. Scouleri (*b*; 1); C. speciosa (*b*, *p*, or *w*; 1-1½); C. thyrsoidea (*y*; 1-1½); C. Tommasiniana (*b*; ¾-1); C. Trachelium (variable; 2-3); C. Van Houttei (*b*; 2); Centaurea alpina (*y*; 3); C. atropurpurea (*p*; 3); C. aurea (*o-y*; 2); C. babylonica (*y*; 6-10); C. dealbata (*pi*; 1-1½); C. macrocephala (*y*; 3); C. montana (*b*; 2) and vars.; Centranthus ruber (*r*; 2-3); Cephalanthera rubra (*pi-p*; ½-1½); Cerastium alpinum (*w*; ¼); C. Biebersteinii (*w*; ½); C. Boissieri (*w*; ¼-1); C. tomentosum (*w*; ½); Cheiranthus Cheiri (variable, *sc*; 1-2); Chelone Lyoni (*p*; 3-4); Chenopodium Bonus-Henricus (*g*; 1); Chrysanthemum argentum (*w*; 1); Cimicifuga racemosa (*w*; 3-5); Cineraria maritima (*y*; 2); Clematis recta (*w*, *sc*; 2-3); Clintonia

July (Hardy Perennials)—*continued.*

uniflora (*w*; ½); Cnicus acaulis (*p*; 2); C. spinosissimus (*y*; 3); C. undulatus (*p*; 1); Commelina virginica (*b*; ½); Coreopsis auriculata (*y* and *p-br*; 1-1½); C. grandiflora (*y*; 3-4); C. lanceolata (*y*; 1-3); C. verticillata (*y*; 1-2); Coris monspeliensis (*l*; ½); Coronilla iberica (*y*; ½); C. varia (*pi* and *w*, or *w*; 1); Crinum capense (*r*); Cynanchum roseum (*pi-r*; 1-1½); Delphinium azureum (*b*; 3); D. cashmirianum (*b*; 1-1½); D. exaltatum (*b* or *w*; 3-6); D. formosum (*b* and *v*; 1½-3); D. nudicaule (*r* and *y*; 1-1½); Dianthus alpestris (*r*; ½-¾); D. arenarius (*w*); D. atrorubens (*r*; 1); D. barbatus vars.; D. cæsius (*pi*, *sc*; ¼-½); D. cruentus (*r*); D. fimbriatus (*pi*; 1); D. Fischeri (*pi*); D. fragrans (*w* and *p*, *sc*; ½-¾); D. glacialis (*r-p*; ¼); D. monspessulanus (*r*; ½-1); D. neglectus (*pi*; ¼); D. petræus (*pi*; ½); D. plumarius (*w* and *p*, *sc*; ¾-1); D. Seguierii (*pi-p*; 1); D. superbus (*pi*, *sc*; ¾-1½) and var.; Diapensia lapponica (*w*; ¼); Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Digitalis ambigua (*y* and *br*; 2-3); Diphylleia cymosa (*w*; 1); Doronicum altaicum (*y*; 1); D. plantagineum excelsum (*y*; 5); Dracocephalum altaiense (*b*; ½-¾); D. austriacum (*b*; 1½); D. peregrinum (*b*); Drosera filiformis (*p*; 1); Echinops commutatus (*w*; 5-7); E. Ritro (*b*; 3); Epilobium angustifolium (*r*; 3-6); E. Dodonæi (*pi*; 1); E. hirsutum (*pi* or *w*, *sc*; 3-5); E. obcordatum (*pi-p*); E. rosmarinifolium (*r*; 2); Epimedium macranthum (*w*; 10-15); E. pinnatum (*y*; 8-12); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Erodium macradenum (*v* and *p*; ½); E. Manescavi (*p-r*; 1-2); E. pelargoniiflorum (*w* and *p*); E. trichomanefolium (*pi-w*; ¼-½); Eryngium alpinum (*b*; 1½-2); E. amethystinum (*b*; 1-2); E. Bourgati (*b*; 1-2); E. giganteum (*b*; 3-4); Erysimum ochroleucum (*y*); E. pumilum (*g-y*, *sc*; ¼); Eucomis punctata (*g* and *br*; 2); Fœniculum vulgare (*y*); Fritillaria Hookeri (*l*; ½); Funkia grandiflora (*w*; *sc*); Galax aphylla (*w*; ¼-½); Galega officinalis (*b*; 3-4); G. orientalis (*b*; 2-4); Galtonia candicans (*w*, *sc*); Gentiana affinis (*b*; ½-1); G. algida (*w* and *b*; ¼-½); G. bavarica (*b*; ¼); G. cruciata (*b*; ½); G. lutea (*y*; ¼-½); G. septemfida (*b*; ½-1½); Geranium argenteum (*r*; ½); G. macrorhizon (*r* or *p*; 1); Geum elatum (*o-y*); G. triflorum (*p* and *w*); Globularia nana (*b*); G. nudicaulis (*b*; ½); G. vulgaris (*b*; ½); Glycyrrhiza glabra (*b*; 3-4); Goodyera pubescens (*w*; ¼); Gypsophila paniculata (*w*; 2-3); Habenaria fimbriata (*l-p*; 1-1½); Hablitzia tamnoides (*g*); Hedysarum coronarium (*r*; 3-5); Helichrysum arenarium (*y*; ½-1); Hemerocallis Dumortieri (*o-y*; 1-1½); H. flava (*o-y*, *sc*; 2-3); H. fulva (*y*; 2-4); H. Middendorfii (*y*; 2-3); H. minor (*y*, *sc*; ¼-¾); Hesperis matronalis (variable; 2-3); Heuchera americana (*r*; 1½); H. hispida (veined *p*); H. sanguinea (*r*; ¾-1½); Hieracium aurantiacum (*o-r*; 1-1½); Houstonia cærulea (*b* or *w*; ¼); H. serpyllifolia (*w*; ¼); Humulus Lupulus (*g-y*); Hypericum elegans (*y*; 1); H. patulum (*y*; 6); H. perforatum (*y*; 1-3); Incarvillea Olgæ (*pi*; 3-4½); Inula glandulosa (*y*; 2); Iris iberica (*w* or *l*, *p*, and *p-br*; ¼-½); I. Monnieri (*g-y*, *sc*; 3-4); I. xiphioides (*p* and *y*; 1-2); Kniphofia aloides (*r*, fading to *o* and *g-y*; 3-4); Lactuca alpina (*p-b*; 3); Lamium maculatum (*p*); Lathyrus magellanicus (*b-p*); L. roseus (*pi*); L. rotundifolius (*pi*); Lavandula vera (*b* or *w*; 1-2); Leucoium æstivum (*w* and *g*; 1½); L. Hernandezii (*w* and *g*; 1-1½); Lilium auratum (*w*, *y*, and *p*; 2-4); L. bulbiferum (*r*; 2-4); L. canadense (*y* or *r*, and *p*; 1½-3); L. Catesbæi (*o-r* and *p*; 2-3); L. chalcedonicum (*r*; 2-3); L. croceum (*r-y*; 3-6); L. davuricum (*r*; 2-3); L. elegans (*r*); L. Krameri (*w* and *r*, *sc*; 3-4); L. Leichtlinii (*y*, *p*, and *r*; 2-3); L. Martagon (*p-r* and *p*; 2-3); L. pardalinum (*o-r* and *p*; 3-7); L. Parryi (*y* and *br-r*, *sc*; 2-6); L. philadelphicum (*o-r* and *p*; 1-3); L. pomponium (*r* or *r-o*; 1½-3); L. pseudo-tigrinum (*r* and *bk*; 3-4); L. pyrenaicum (*y*; 2-4); L. speciosum (*w*, or *p-r* and *w*; 1-3); L. superbum (*o-r*; 4-6); L. tenuifolium (*r*; ½-1); L. tigrinum (*o-r* and *p-bk*; 2-4) and vars.; L. Washingtonianum (*w*, and *p* or *l*,

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sc; 3-5); Limnanthemum nymphæoides (*aq*, *y*); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); L. dalmatica (*y*; 3-4); L. hepaticæfolia (*l-p*; ½); L. purpurea *b-p*; 1-3); L. triornithophora (*p* and *y*); Linum alpinum (*b*; ½); L. narbonense (*b* or *w*; 2); Liparis lilifolia (*br-p*); Lithospermum Gastoni (*b*; 1-1½); L. purpureo-cæruleum (*r*, turning *p*; 1); Lophanthus anisatus (*b*; 3); L. scrophulariæfolius (*p*; 5); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus leucophyllus (*pi*; 2-3); L. nootkatensis (*b*, and *p*, *w*, or *y*; 1-1½); L. ornatus (*b*; 1-2); L. perennis (*b*; 2); L. polyphyllus (*b*; 4); L. subcarnosus (*b* and *y*; 1); Lychnis alpina (*pi*; ½); L. chalcedonica (*r*; 1½-3½); L. coronaria (*r*; 3); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. f. Haageana (*r*); L. Lagascæ (*pi* and *w*; ¼); L. pyrenaica (*pi-w*; ¼); L. vespertina (*w*, *sc* at evening; 1-3); L. Viscaria (*pi*; 1); Lysimachia atropurpurea (*p*; 2); L. ciliata (*y*; 2-5); L. clethroides (*w*; 3); L. Nummularia (*y*); L. punctata (*y*; 1); L. vulgaris (*y*; 2-3); Lythrum Salicaria (*r-p*; 2-5); Malva Alcea fastigiata (*r*; 2-3); M. moschata (*pi*; 2-2½); Meconopsis cambrica (*y*; 1); Mertensia alpina (*b*; ½-¾); M. sibirica (*p-b*; ½-1½); M. virginica (*p-b*; 1-2); Mimulus cardinalis (*r*; 1-3); M. luteus (*y*; ¾-1); M. l. cupreus (*r-br*, *p-br*, or *r*; ¾-1); M. moschatus (*y*); Mitchella repens (*w* and *p*, *sc*); Mœhringia muscosa (*w*; ¼); Monarda didyma (*r*; 1½); M. fistulosa (*p*; 2-5); Morina longifolia (*r*; 2); Muscari comosum monstrosum (*b-v*; 1-1½); Mutisia decurrens (*o*); Myosotis alpestris (*b*, *sc* at night; ¼); Nierembergia rivularis (*w*); Nothoscordum fragrans (*w*, *sc*; 1¼-2); Nuphar advena (*aq*, *r*); N. luteum (*aq*, *y*, *sc*); Nymphæa alba (*aq*, *w*); N. odorata (*aq*, *w*, tinged *r*, *sc*); N. pygmæa (*aq*, *b*, *sc*); N. tuberosa (*aq*, *w*, *sc*); Œnothera acaulis (*w*, turning *r*; ½); Œ. californica (*w*, varying to *pi*, and *y*, *sc*); Œ. eximia (*w*; ¾-1); Œ. glauca (*y*; 1-2); Œ. g. Fraseri (*y*; 1); Œ. linearis (*y*; ¾-1½); Œ. pallida (*w* and *y*, turning *r*; 1½); Œ. speciosa (*w*, turning *r*; 2-3); Œ. taraxacifolia (*w*, turning *r*; ½); Omphalodes Luciliæ (*l-b*; ¼-½); Ononis Natrix (*y*; 1½-2); O. rotundifolia (*pi*; 1-1½); Onopordon Acanthium (*p*; 4-5); Onosma stellulatum tauricum (*y*; ½-¾); Ornithogalum arabicum (*w* and *bk*, *sc*; 1-2); O. narbonense (*w* and *g*; 1-1½); O. pyramidale (*w*; 1½-2); Ourisia coccinea (*r*; ½-1); Oxalis corniculata (*y*); Oxytropis montana (*b* and *p*; ½); Pedicularis dolichorhiza (*o*, *y*; 1-1½); Pentstemon antirrhinoides (*y*; ¾-1½); P. barbatus (*pi*; 3) and vars.; P. confertus (*y*; ½-1½); P. heterophyllus (*pi* or *pi-p*; 1½); Petalostemon candidus (*w*; 1); P. violaceus (*pi-p*; 1); Phalaris arundinacea (*p*; 3-5); Phlomis cashmeriana (*l*; 2); P. herba-venti (*p-v*; 1-1½); P. glaberrima (*r*; 1-2) and vars.; P. maculata (*p*; 2); Phormium Cookianum (*y*; 3-6) and var.; Phuopsis stylosa (*p*; 1); Physostegia virginiana (*pi-w* or *p*; 1½-4); Phyteuma comosum (*p* or *b*; ½-1); P. humile (*b*; ½); Phytolacca decandra (*w*; 3-10); Pinguicula grandiflora (*v-b*); Platycodon grandiflorum (*b*; ½-1); Polemonium cæruleum (*b*; 2); P. confertum (*b*; ½); P. humile (*b* or *p*; ½); Polygonum cuspidatum (*c-w*; 4-8); P. sachalinense (*g-y*; 10-12); P. vaccinifolium (*pi*); Potentilla alpestris (*y*; ½-1); P. argyrophylla (*y*; 1½-3); P. Hopwoodiana (*pi* and *y*; 1½) P. nitida (*pi*); P. unguiculata (*w*; ¾-1); Pratia angulata (*w*; ¼); P. repens (*v-w*; ¼); Primula auriculata (*p* and *w*; ½); P. cortusoides (*pi*; ½-¾); P. denticulata (*l*; ¾-1); P. farinosa (*p* and *y*; ¼-1); P. glutinosa (*b-p*; ¼); P. luteola (*y*; 1½-2); P. minima (*pi* or *w*); P. obconica (*w*; ½-1); P sikkimensis (*y*; 1½-2); P. viscosa (*pi-p* and *w*; ¼); Pyrethrum achilleæfolium (*y*; ½); P. corymbosum (*w*; 1); P. Tchihatchewii (*y* and *w*; 2); Pyrola rotundifolia (*w*, *sc*; ½); P. secunda (*g-w*; ¼-½); Pyxidanthera barbulata (*w* or *pi*; ¼); Rudbeckia pinnata (*y*; 3); R. speciosa (*o*; 2-3); Salvia asperata (*w*; 2); S. carduacea (*l*; 1); S. Rœmeriana (*r*; 1-2); Saponaria ocymoides (*r* or *pi*); Saxifraga aizoides (*o-y*, dotted *r*); S. aretioides (*o-y*; ¼); S. cæspitosa (*w*; ¼); S. Cotyledon (*w*; 1-2); S. diversifolia (*y*); S. hypnoides (*w*); S. longifolia (*w*, dotted *r*); S. Maweana (*w*); S.

July (Hardy Perennials)—*continued.*

Rocheliana (*w*; ½) and var.; S. sancta (*y*); S. sarmentosa (*w*, spotted; ⅝); S. umbrosa (*pi-w*; ½-1); Scabiosa amœna (*l* or *pi*; 2-3); S. caucasica (*b*; 1); S. Webbiana (*c-y*; ½); Scorzonera hispanica (*y*; 3); S. undulata (*p-pi*; 1-2); Sedum Aizoon (*y*; 1); S. album (*w*; ½-½); S. anglicum (*w* or *pi*; ½); S. glaucum (*pi-w*); S. japonicum (*y*); S. lydium (*pi*); S. reflexum (*y*); S. Rhodiola (*g* or *r-p*); Sempervivum arenarium (*y*; ½-⅝); S. atlanticum (*r*; 1); S. Boissieri (*r*; ⅝); S. Braunii (*y*; ½-⅝); S. calcaratum (*r-w*; 1); S. calcareum (*g-r*; 1); S. fimbriatum (*r*; ½-⅝); S. Funckii (*r-p*; ½-⅝); S. Lamottei (*pi* and *p*; 1); S. Pomelii (*pi-r*; ½-⅝); S. soboliferum (*y*; ½-⅝); S. Wulfeni (*y* and *m-p*; ½-⅝); Senecio Doronicum (*y*; 1); S. pulcher (*p* and *y*; 1-2); Sida Napæa (*w*; 4-10); Silene acaulis (*pi* or *w*; ½); S. alpestris (*w*; ½); S. Elizabethæ (*pi* and *p*; ⅝); S. maritima (*w*); S. Saxifraga (*y*; ½-½); S. Schafta (*p*; ½); S. virginica (*r*; 1-2); Silphium laciniatum (*y*; 3-6); Solanum crispum (*b-p*; 12-14); Solidago Drummondii (*y*; 1-3); Spigelia marilandica (*y* and *r*; ½-1½); Spiræa Filipendula (*w* or *pi*; 2-3); S. palmata (*r*; 1-2); S. Ulmaria (*w*; 2-4); Stachys lanata (variable; 1-1½); S. Maweana (*y*, blotched; 1-1½); Statice elata (*b*; 2); S. tatarica (*r*; 1); Symphyandra Wanneri (*b*; ½); Symphytum tuberosum (*o*; 1-2); Thalictrum aquilegifolium (*w*, and *p* or *w*; 1-3); Thermopsis barbata (*p*; 1); T. montana (*y*; 1-2); Trifolium alpestre (*p*; ½-1); T. Lupinaster (*p*; 1-1½); T. uniflorum (*b* and *p*; ½); Trollius europæus (*y*; ½-2); Tulipa Clusiana (*w*, *r*, and *p-bk*; 1-1½); Veratrum album (*w*; 3-4); Veronica incana (*b*; 2); V. spicata (*b* and *p*; ½-1½); V. virginica (*w* or *b*; 2-6); Viola cornuta (*b*); V. Riviniana (*b-p* or *l*); V. rothomagensis (*b*, striped *bk*); V. tricolor (*p*, and *w* or *o-y*, &c.; ½-1½); Wahlenbergia Kitaibelii (*p-b*; ½); W. tenuifolia (*v-b* and *w*; ½-½); Wulfenia carinthiaca (*b*).

SHRUBS.—Abutilon striatum (*o-y*; 10); Actinidia Kolomikta (*w*); Æthionema grandiflorum (*pi*; 1½); Amorpha canescens (*b*; 3); Asclepias Douglasii (*p-l*; 2-3); A. quadrifolia (*w*, *sc*; 1); A. syriaca (*p*, *sc*; 3-5); Azalea viscosa (*w*, *sc*; 2-4) and vars.; Benthamia fragifera (*w*; 10-15); Berberis Fortunei (*y*; 4); Bignonia capreolata (*o*; 20); Calluna vulgaris (variable; 1-3); Calycanthus occidentalis (*r*; 6-12); Ceanothus americanus (*w*); Cephalanthus occidentalis (*w-y*; 7); Clematis cærulea (*v*; 8) and vars.; C. Flammula (*w*, *sc*; 20); C. flor.da (*w*; 10); C. graveolens (*y*; 15); C. paniculata (*w*, *sc*; 20); C. virginiana (*w*, *sc*; 15-20); C. Vitalba (*w*, *sc*; 8); C. Viticella (*b*, *p*, or *pi*; 20); Clethra acuminata (*w*, *sc*; 10-15); C. alnifolia (*w*; 3-4); C. paniculata (*w*, *sc*; 3-4); C. tomentosa (*w*; 3-4); Colutea arborescens (*y*; 6-10); Convolvulus Scammonia (*c* or *r*; 2); Cornus paniculata (*w*; 4-8); C. sericea (*w*; 5-8); Dabœcia polifolia (*w*, *pi*, or *p*; 1-2); Desmodium canadense (*r-p*; 4-6); Ephedra vulgaris (*w*; 1-2); Erica vagans (*p-r*; 1); Frankenia lævis (*pi-w*); F. pulverulenta (*r*; ½); Gaultheria procumbens (*w*); Halimodendron argenteum (*p*; 4-6); Helianthemum argenteum (*y* and *bk*; 4); H. halimifolium (*y*; 3-4); H. vulgare (*y*); Hydrangea hortensis (variable; 2-3); H. paniculata grandiflora (*w*); Hypericum calycinum (*y*; 1); Iberis saxatilis (*w*; ½-½); I. sempervirens (*w*; ¾-1); Indigofera Gerardiana (*r*); Jasminum officinale (*w*, *sc*); Kalmia angustifolia (*p* or *r*; 2-3); K. latifolia (*pi*, varying to *w*; 3-10); Kerria japonica (*o-y*; 3-4); Ligustrum Ibota (*w*); L. Massalongianum (*w*, *sc*; 6); L. ovalifolium (*w*); Lithospermum prostratum (*b* and *r-r*); Lonicera Periclymenum (*r*); Lupinus arboreus (*y*, *sc*); Lycium afrum (*v*; 6-10); L. barbarum (*p* and *y*); Magnolia glauca (*w*, *sc*; 15); Margyricarpus setosus (*g*; 2-4); Opuntia missouriensis (*y*); Osmanthus fragans (*y* or *w*; 6-10); Passiflora cærulea (*p*, *w*, and *b*, *sc*); Philadelphus Gordonianus (*w*; 10); Rhexia ciliosa (*p*; 1-1½); R. virginica (*p*; ½-1); Rhododendron ferrugineum (*r* and *y*; 1); R. hirsutum (*r*; 1-2); Rhus Cotinus (*p* or *pi-c*; 6-8); Rosa alba (*w* or *pi-w*, *sc*; 4-7); R. blanda (*pi*; 1-3); R. bracteata (*w*; 2); R. canina (*pi*; 6-8) and vars.; R. centifolia (*pi-p*, *sc*; 3-6) and vars.; R. damascena (*w* or *r*, *sc*; 2-4); R. gallica (*r*; 2-3); R. hemispharica (*y*; 3); R. indica (*r*; 4-20); R. lucida (*r*; 1-2) and var.; R. nitida (*r*; 2); R. sempervirens (*w*, *sc*) and vars.; Rubus australis (*pi* or *w*, *sc*); R. Chamæmorus (*w*; ½-⅔); R. fruticosus (*w* or *pi*); R. laciniatus (*w* or *pi*); Salvia ringens (*r-p*; 1-2) Smilax aspera (*w* or *pi-w*, *sc*; 5-10); Solanum acanthodes (*b-p*; 3-6); Spartium junceum (*y*, *sc*; 6-10); Spiræa cantoniensis (*w*; 3-4); Statice arborescens (*b*; 2); Stuartia pentagyna (*c*; 10); Symphoricarpus occidentalis (*pi-w*); S. racemosus (*pi*; 4-6); Tamarix gallica (*w* or *pi*; 5-10); T. parviflora (*pi*); Tecoma radicans (*r*; 25); Veronica carnosula (*w*); V. Lyallii (*w* and *pi*); V. Traversii (*w*; 2½); Viburnum Opulus (*w*; 6-8); Wistaria chinensis (*b*); W. japonica (*w*); Yucca angustifolia (*w*; 1); Y. gloriosa (*r*; 4-6) and vars.; Zenobia speciosa (*w*; 2-4).

Half-hardy.—ANNUALS.—Calandrinia grandiflora (*pi*; 1); C. Menziesii (*p-r*; ½); C. umbellata (*m-r*; ½); Gomphrena globosa (variable; 1½); Grammanthes chlorædora (*o-y*, becoming *r*; ½-⅔); Grammatocarpus volubilis (*y*); Ipomœa hederacea (*b*; 10); Maurandya Barclayana (*v-p* and *g*); Mentzelia bartonioides (*g-y*); M. ornata (*w*, *sc*; 2); Nicotiana acutiflora (*w*; 1-2); N. suaveolens (*w*, *sc*; 1-2); N. Tabacum (*pi*, 4); Perilla ocimoides crispa (*w*; 1-3); Portulaca grandiflora (*y-p*; ½); Ricinus communis (*y*; 3-5); Salpiglossis sinuata (*p* and *y*; 2) and vars.; Schizanthus candidus (*w*; 2); S. Grahami (*l* or *pi*, and *y*; 2); Schizopetalon Walkeri (*w*; 1-2); Zinnia elegans, and vars.

BIENNIALS.—Celosia betonicæfolia (*y*, spotted *p*; 2); Lobelia varieties; Mathiola incana (*p*; 1-2).

PERENNIALS.—Abronia arenaria (*y*; ¾-1½); Alstrœmeria Pelegrina (*w* or *y*, striped *pi*; 1); Arctotis acaulis (*y* and *r*; ½); A. arborescens (*w* and *pi*; 2); A. grandiflora (*o*; 1½); A. speciosa (*y*; 1½); Calceolaria arachnoidea (*p*; 1); C. Fothergillii (*y*, spotted *r*; ½-⅔); Centaurea ragusina (*y*; 2); Cœlestina ageratoides (*b*; 1); Conandron ramondioides (*w*, or *pi* and *p*; ½); Crocosmia aurea (*o-r*; 2); Cypella Herberti (*y*; 1); Erodium Reichardi (*w* and *pi*; ½); Ferraria Ferrariola (*y-br*); Francoa appendiculata (*r*; 2); F. ramosa (*w*; 2-3); F. sonchifolia (*pi*; 2); Hedychium Gardnerianum (*y-y*, *sc*; 3-5); Heteranthera limosa (*aq*, *v-b*); Lilium giganteum (*w*; 4-10); L. japonicum (*w*; 1-2); Linum flavum (*y*; 1-1½); L. Macraei (*o*; 1); Lobelia cardinalis (*r*; 1-2); L. fulgens (*r*; 1-2); L. splendens (*r*; 1-2); Maurandya scandens (*p-v*); Mazus pumilio (*v*); Myosotis azorica (*p*, becoming *b*; ½-⅔); Neja gracilis (*y*; 1); Nierembergia gracilis (*w*, *p*, and *y*; ½-1); Ophiopogon japonicus intermedius (*l*; 1½); Pelargonium Endlicherianum (*p-pi*; 2); Romneya Coulteri (*w*; 2-4); Statice callicoma (*p*; 1); Triteleia laxa (*b*; 1-1½); T. porrifolia (*w-v*); Tropæolum tricolorum (*o-r* tipped *bk*, and *y*); Verbena venosa (*l* or *p*; 2); Viola hederacea (*b* or *w*).

SHRUBS.—Calceolaria bicolor (*y* and *w*; 2-3); C. hyssopifolia (*y*; 1-2); C. scabiosæfolia (*y*); C. varieties; Camellia japonica (variable; 20) and vars.; Cassia corymbosa (*y*; 6-10); Ceanothus integerrimus (*w*; 3-6); Cedronella triphylla (*w* or *p*; 3-4); Celsia Arcturus (*y* and *p*; 4); Cistus laxus (*w*, marked *y*; 3); C. monspeliensis (*w*; 4); C. psilosepalus (*w* and *y*; 2-3); C. rotundifolius (*p*, marked *y*; 1); Cneorum pulverulentum (*y*; 1-3); Coronilla glauca (*y*, *sc* by day; 2-4); C. minima (*y*, *sc*; ½); Eccremocarpus longiflorus (*y* and *g*); E. scaber (*r* or *o-r*); Embothrium coccineum (*o-r*; 3); Ephedra nebrodensis (*w*; 3-4); Escallonia floribunda (*w*; 10); E. rubra (*r*; 3-6); Fuchsia macrostema globosa (*p-r* and *p-r*; 5-6); F. m. gracilis (*p* and *r*; 6-10); Grindelia glutinosa (*y*; 2); Hudsonia ericoides (*y*; 1); Hydrangea quercifolia (*w*; 4-6); Hypericum empetrifolium (*y*; ½-1); H. Hookerianum (*y*; 2); Illicium anisatum (*y-w*; 4); I. floridanum (*r*; 8); Leycesteria formosa (*w* and *p*; 4-6); Mesembryanthemum edule (*y*); Mitraria coccinea (*r*); Myrtus communis (*w*; 3-10); Olearia dentata (*pi-w*); Ononis arragonensis (*y*; 1-2); Othonnopsis cheirifolia (*y*; ¾-1); Ozothamnus rosmarinifolius (*w*; 8-9); Periploca

July (Hardy Shrubs)—*continued.*

July (Half-hardy Shrubs)—*continued.*

græca (*g* and *br*); Pernettya mucronata (*w*; 6); Photinia serrulata (*w*; 10-20); Phygelius capensis (*r*; 3); Reaumuria hypericoides (*p*; 2); Rhododendron Dalhousiæ (*w*, or *pi-w*; 6-8); R. Maddeni (*w*; 6-8); Salvia Candelabrum (*w*, *p*, and *v*; 3-4); Tecoma australis (*y-w*, tinged *p* or *r*); Veronica Andersonii (*b-v*; 1½); V. Hulkeana (*l*; 1-3); Yucca Whipplei violacea (*v*; 4-12); Zauschneria californica (*r*; 1).

Tender.—ANNUALS.—Begonia humilis (*i-h*, *w*; 1); Browallia elata (*c-h*, *b*; 1½); B. grandiflora (*c-h*, *l*; 1-3); Celosia argentea (*i-h*, *w*); C. cristata (*i-h*, *r*); C. Huttonii (*i-h*, *r*; 1-2); C. pyramidalis (*i-h*, variable; 1½); Cleome pungens (*st*, *w* or *pi*; 1-3); Desmodium gyrans (*st*, *v*; 1-3); Heliotropium indicum (*st*, *b*; 1); Impatiens Balsamina (*st*, *r*; 1-2); I. flaccida (*c-h*, *p*; ½-1½); Ipomœa Bona-nox (*st*, *w*; 10); I. filicaulis (*i-h*, *w* or *c*, and *p*); I. Quamoclit (*i-h*, *r*; 6); Martynia fragrans (*c-h*, *r-p* and *y*, *sc*; 2); M. proboscidea (*c-h*, *y-w*, *g*, and *v*); Pentapetes phœnicea (*st*, *r*; 2-3); Porana racemosa (*i-h*, *w*); Waitzia aurea (*c-h*, *o-y*; 1-2); W. nivea (*c-h*, *w*, *pi*, or *y*; 1½).

BIENNIALS.—Convolvulus erubescens (*c-h*, *r-pi*; 12); Humea elegans (*c-h*, *br-r*, *pi*, or *r*; 5-6).

PERENNIALS.—Achimenes heterophylla (*i-h*, *r*; 1); A. pedunculata (*i-h*, *r*; 1½); A. picta (*i-h*, *r*; 1½); Acineta Barkeri (*c-h*, *y* and *r*); Æchmea Mariæ Reginæ (*st*, *b*; 2); Aerides affine (*st*, *pi*; 3); Agapanthus umbellatus (*c-h*, *b*; 2-3); Albuca Nelsoni (*c-h*, *w*, striped *r*; 4-5); Allamanda chelsoni (*st*, *y*); A. nobilis (*st*, *y*); Amomum angustifolium (*st*, *r*, *y*, or *r* and *y*; 8); Anacampseros arachnoides (*c-h*, *w*; ½-¾); A. rubens (*c-h*, *r*; ½-¾); A. rufescens (*c-h*, *r*; ½); A. varians (*c-h*, *r*; ¼); Aneilema biflora (*c-h*, *b*; 1); Anthurium Bakeri (*st*, *g*, *pi*, and *r*); Arisæma galeata (*c-h*, *g* and *p*; 1); Arthropodium pendulum (*c-h*, *w*; 1½); Astilbe rubra (*c-h*, *pi*; 4-6); Babiana disticha (*c-h*, *b*, *sc*; ½); Bæa hygrometrica (*c-h*, *b* and *b-y*; ½); Barbacenia purpurea (*i-h*, *p*, *sc*; 1½); B. Rogieri (*i-h*, *p*, *sc*; 1½); Batatas bignonioides (*i-h*, *p*); Begonia acutiloba (*i-h*, *w*); B. amabilis (*i-h*, *pi* or *w*; ¾); B. amœna (*i-h*, *pi*; ¼); B. boliviensis (*i-h*, *r*; 2); B. Bruantii (*i-h*, *w* or *pi*); B. Chelsoni (*i-h*, *o-r*; 2); B. Clarkii (*i-h*, *r*); B. coriacea (*i-h*, *pi*; ¾); B. Davisii (*i-h*, *r*; ½); B. Dregii (*i-h*, *w*; 1); B. echinosepala (*i-h*, *w*; 1½); B. eximia (*i-h*, *w* and *r*); B. geranifolia (*i-h*, *r* and *w*; 1); B. geranioides (*i-h*, *w*; 1½); B. hydrocotylifolia (*i-h*, *pi*; ½); B. imperialis (*i-h*, *w*; 3); B. malabarica (*i-h*, *pi*; 2); B. maxima (*i-h*, *w*); B. monoptera (*i-h*, *w*; 1-2); B. Pearcei (*i-h*, *y*; 1); B. prismatocarpa (*st*, *o* and *y*; 3); B. Richardsiana (*i-h*, *w*; 1); B. rosæflora (*i-h*, *pi*); B. rubricaulis (*i-h*, *w* and *pi*; 1); B. rubro-venia (*i-h*, *w*; 1-1½); B. strigillosa (*i-h*, *pi*; ¾); B. Sutherlandi (*i-h*, *o-r*; 1-2); B. Thwaitesii (*st*, *w*; ½); B. Veitchii (*i-h*, *r*; 1); B. xanthina (*i-h*, *y*; 1); Billbergia amœna (*st*, *g-w*, tipped *b*; 2); Blandfordia aurea (*st*, *o-y*; 1-2); B. grandiflora (*st*, *r*; 2); B. nobilis (*st*, *o* and *y*; 2); Bletia florida (*st*, *pi*; 2); Blumenbachia contorta (*c-h*, *o-r*); Boucerosia maroccana (*c-h*, *r-p* and *y*; ¼); Brassia Lawrenceana (*i-h*, *y*, spotted *br* and *g*; 1); B. maculata (*i-h*, *y*, spotted *br* and *p*; 1); Bromelia Fernandæ (*st*, *y*); Broughtonia sanguinea (*st*, *p-r*; 1½); Brunsvigia Cooperi (*c-h*, *y*, edged *r*; 1½); B. Josephineæ (*c-h*, *r*; 1½); Bulbophyllum Lobbi (*i-h*, *y*); Burbidgea nitida (*st*, *o-r*; 2-4); Calanthe Masuca (*i-h*, *v* and *v-p*; 3-4); C. veratrifolia (*i-h*, *w*; 2-3); Calotis cuneifolia (*c-h*, *b*; 1); Camaridium ochroleucum (*st*, *y-w*; 1); Canistrum aurantiacum (*st*, *o-y*); Canna indica (*st*, *y* and *r*; 3-6); Catasetum Russellianum (*st*, *g*; 3); Cattleya Aclandiæ (*st*, *br*, *y*, *pi*, and *p*); C. citrina (*i-h*, *y*, *sc*; ½-¾); C. crispa (*i-h*, *w* or *w-l*, and *r*; 1); C. Harrisoniæ (*i-h*, *pi*, tinged *y*; 2) and var.; C. intermedia (*i-h*, variable; 1); C. Lemoniana (*i-h*, *pi* and *y*; 1); C. Regnelli (*i-h*, *g*, *b*, *pi-p*, *w*, &c.); Ceropegia Sandersoni (*c-h*, *g*, veined); Chironia linoides (*c-h*, *r*; 1-2); Cineraria cruenta (*c-h*, *r-p*; 2) and vars.; Cirrhopetalum Medusæ (*st*, straw, dotted *pi*); C. Thouarsii (*st*, *o* and *y*, dotted *r*); Cissampelos mauritiana (*st*, *y* and *g*); Cœlogyne asperata (*st*, *c*, *br*, and *y*; 2); C. pandurata (*st*, *g* and *bk*, *sc*; 1½); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); C.

July (Tender Perennials)—*continued.*

viscosa (*i-h*, *w* and *br*; 1); Commelina elliptica (*c-h*, *w*; 1½-2); Convolvulus mauritanicus (*c-h*, *b* and *w*); Crassula Bolusii (*c-h*, *pi-w*; ¼-½); C. marginalis (*c-h*, *w*); C. rosularis (*c-h*, *w*; ½); Crinum amabile (*st*, *r*, *sc*); C. cruentum (*st*, *r*); C. giganteum (*st*, *w*, *sc*); C. purpurascens (*st*, *p-r*); Curcuma albiflora (*st*, *w* and *y*; 2); C. cordata (*st*, *r-y*; 1); Cycnoches chlorochilum (*st*, *y-g*, *sc*; 2); Cypripedium barbatum (*st*, *p* and *w*; 1) and vars.; C. Hookeræ (*st*, *y*, *br*, and *pi-p*); C. Parishii (*st*, *g-w* and *p*; 2); C. superbiens (*st*, *w* and *br*); Dendrobium Aphrodite (*c-h*, *o*, *w*, and *r*); D. chrysotis (*st*, *y* and *p*); D. clavatum (*st*, *y* and *r*); D. crystallinum (*st*, *w*, *o*, *p*, and *pi*); D. formosum (*st*, *w* and *o*); Dichorisandra thyrsiflora (*st*, *b*; 4); Dichrotrichum ternateum (*st*, *r*); Disa grandiflora (*c-h*, *pi*, *r*, and *y*; 2-3) and var.; Drimiopsis Kirkii (*c-h*, *w*; ¾); Drosera binata (*c-h*, *w*; ½); D. capensis (*c-h*, *p*; ½); D. spathulata (*c-h*, *p*; ¼); Eichhornia crassipes (*st*, *v*); Epidendrum alatum majus (*c-h*, *y*); E. bicornutum (*st*, *w* and *r*); E. falcatum (*st*, *g-y* and *y*, *sc*); E. nemorale (*st*, *mv* or *pi-l*, and *v*); Episcia fulgida (*st*, *r*; ½); Fragaria indica (*c-h*, *y*); Galaxia ovata (*c-h*, *y*); Galeandra Baueri lutea (*st*, *y*, and *p*; ½); Gesnera discolor (*st*, *r*; 2); G. nagelioides (*st*, *pi*, *r*, and *y*); Gladiolus brachyandrus (*c-h*, *r*; 2); G. cardinalis (*c-h*, *r* and *w*; 3-4); G. Colvillei (*c-h*, *r* and *p*; 1½); G. psittacinus (*c-h*, *r*, *y*, *g*, and *p*; 3); Gloriosa superba (*st*, *o* and *r*; 6); Gloxinia maculata (*st*, *p-b*; 1); Grammatophyllum multiflorum (*st*, *g*, *br*, and *p*; 2); Griffinia dryades (*i-h*, *p-l* and *w*; 1½); G. hyacinthina (*i-h*, *b* and *w*); G. ornata (*i-h*, *b-l*; 1-1½); Guzmannia tricolor (*st*, *w*, *y-g*, *bk-p*, and *r*); Hedychium flavosum (*st*, *y*, *sc*; 2-3); H. flavum (*c-h*, *o*, *sc*; 3); Hessea crispa (*c-h*, *pi*; ¼); Hibiscus coccineus (*c-h*, *r*; 4-8); H. militaris (*c-h*, *pi*; 2-4); Imantophyllum miniatum (*c-h*, *o*; 1-2); Impatiens Jerdoniæ (*st*, *y* and *r*; ¾); I. Sultani (*st*, *r*; 1); Ipomœa Learii (*st*, *b*); I. rubro-cærulea (*st*, *r*, becoming *p-b*); Kæmpferia ornata (*st*, *y* and *o*); Lælia anceps Warnerii (*i-h*, *pi* and *r*); L. purpurata (*i-h*, *w* and *p-r*); Limnocharis Plumieri (*i-h aq*, *y*; 1½); Littonia modesta (*c-h*, *o*; 2-6); Lobelia Erinus (*c-h*, *b*, and *w* or *y*; ½); Lotus australis (*c-h*, *pi*, *w*, or *p-r*; 2); L. jacobæus (*c-h*, *p* and *y*; 1-3); Lycaste cristata (*i-h*, *w* and *p*); Lycoris Sewerzowi (*c-h*, *br-r*, *sc*; 1); Mantisia saltatoria (*st*, *p* and *y*; 1); Manulea rubra (*c-h*, *y*; 1-2); Marica gracilis (*i-h*, *w* or *b*, and *r-br*; 2); Miltonia cuneata (*i-h*, *y* and *r*); Mimosa pudica (*st*, *r*; 1); Mirabilis Jalapa (*c-h*, variable, *sc*; 2); Mormodes pardinum (*st*, *y* and *br*); Nelumbium luteum (*c-h aq*, *y*, *sc*); N. speciosum (*c-h aq*, *w*, *sc*); Nerine flexuosa pulchella (*c-h*, *pi* and *r*; 2); Nymphæa Devoniensis (*st aq*, *pi-r*); N. gigantea (*i-h aq*, *b*); N. Lotus (*st aq*, *r* or *w*); N. scutifolia (*i-h aq*, *b*, *sc*); N. stellata (*st aq*, *b*, *sc*); N. s. zanzibarensis (*st aq*, *b*); N. thermalis (*st aq*, *w*); Odontoglossum crispum (*c-h*, *w*, *y*, and *r-br*); O. hastilabium (*c-h*, *c-w*, *br*, and *w*, *sc*); O. maxillare (*i-h*, *w*, *o*, and *p-br*); O. Uro-Skinneri (*c-h*, *g* or *g-y*, *w*, *r*, &c.); Oncidium ampliatum (*st*, *y*); O. annulare (*i-h*, *br* and *y*); O. barbatum (*st*, *y* and *br*); O. Cebolleta (*st*, *y-r*); O. concolor (*i-h*, *y*); O. cornigerum (*i-h*, *y* and *r*); O. cucullatum (*c-h*, *br-p* and *pi-p*); O. divaricatum (*i-h*, *y* and *br*); O. macranthum (*i-h*, *y* and *p-br*); O. Wentworthianum (*c-h*, *g-y* and *br*); Orthosiphon stamineus (*st*, *l-b*; 2); Ottelia ovalifolia (*st aq*, *g* and *y*); Oxalis elegans (*c-h*, *p*; ½); O. lasiandra (*c-h*, *r*; ¾-1½); Passiflora incarnata (*c-h*, *w*, *p*, and *g*, *sc*); Pelargonium Bowkeri (*c-h*, *p* and *y*; 1); P. fissum (*c-h*, *pi*; 1); P. glauciifolium (*c-h*, *bk-p*, edged *g-y*, *sc*); P. oblongatum (*c-h*, *p-c*; ½); Peristeria elata (*st*, *w*, spotted *l*; 4); Phaius Bensonæ (*st*, *pi-p*, *w*, and *y*; 1); Phalænopsis Aphrodite (*st*, *w*, *r*, *o*, and *y*); Pitcairnia Andreana (*st*, *y* and *r*); P. xanthocalyx (*st*, *y*); Plagiolirion Horsmanni (*st*, *w*); Plumbago rosea (*st*, *pi-r*; 2) and var.; Ranunculus Lyalli (*c-h*, *w*; 2-4); Renanthera coccinea (*i-h*, *p-r*); Richardia africana (*c-h*, *w*; 2); R. albo-maculata (*c-h*, *g-w*; 2); R. melanoleuca (*c-h*, *w* and *p*; 1½); Rivina humilis (*st*, *w-pi*; 1-2); R. lævis (*st*, *w-pi*; 7-8); Saccolabium furcatum (*st*, *w*, spotted

July (Tender Perennials)—*continued.*

pi); Salvia cacaliæfolia (*c-h, b*; 3); S. coccinea (*c-h, r*; 2); Senecio pyramidalis (*c-h, y*; 2); S. speciosus (*c-h, p*; ¾-1); Sinningia concinna (*st, p* and *y*); S. conspicua (*st, y* and *p*; 1); S. Youngiana (*st, v* or *p*; 1-1½); Siphocampylos betulæfolius (*st, r*; 3); S. glandulosus (*st, pi*; 3); S. Humboldtianus (*st, r*; 3); Sobralia macrantha (*st, p* and *r*; 6-8); Solanum sisymbriifolium (*c-h, b* or *w*; 4); Sollya heterophylla (*c-h, b*; 6), S. parviflora (*c-h*; *b*); Sonchus gummifer (*c-h, y*; 2-3); Sonerila Bensoni (*st, pi-p*); S. margaritacea (*st, pi*) and var.; Spathoglottis rosea (*st, pi*); Spigelia splendens (*st, r*; 1½); Stachys coccinea (*c-h, r*; 1-2); Stanhopea oculata (*st, y*, spotted *l*); S. tigrina (*st, o*, blotched *p-br, sc*); Stapelia Asterias (*c-h, v, y*, and *p*; ½); S. sororia (*c-h, p* and *y*; ½-¾); Stauropsis Batemanni (*st, y*, &c.); Streptocarpus Saundersii (*st, b*; 1); Stylidium graminifolium (*c-h, p*; ½-1½); S. spathulatum (*c-h, y*; ½); Swainsonia galegifolia (*c-h, r*) and vars.; S. Greyana (*c-h, pi*; 2-3); Talauma pumila (*st, c, sc*; 2-4); Teucrium Chamædrys (*c-h, pi*); Thunbergia erecta (*st, b, o*, and *y*; 6) and var.; Tillandsia psittacina (*st, r, y*, and *g*); Torenia flava (*st, y* and *p*; ½-¾); T. Fournieri (*st, v, l*, and *y*; ½-¾); Tropæolum peregrinum (*c-h, y*); Turnera ulmifolia (*st, y*; 2-4); Tussacia pulchella (*st, r*; 1); Utricularia bifida (*c-h aq, y*); U. montana (*st, y, w*, and *g*); Vanda Parishii (*st, g-y, m, w*, &c., *sc*); V. Roxburghii (*st, g, v-p*, and *w*); V. teres (*st, w, pi-m*, &c.); Villarsia reniformis (*c-h, y*; ½-3); Vinca rosea (*i-h, pi* or *w*); Wahlenbergia tuberosa (*c-h, w* and *pi*; ½-2); Warrea tricolor (*st, y, p*, and *w*); Watsonia rosea (*c-h, pi*; 2); Zebrina pendula (*i-h, w*, and *pi-p*); Zygopetalum Clayi (*i-h, p-br, v-p*, and *w*); Z. cœleste (*c-h, b, p, m*, &c; 1½-1½).

SHRUBS.—Abutilon pulchellum (*c-h, w*; 8); A. venosum (*c-h, o*, veined *r*; 10); Acacia dealbata (*c-h, y*; 10-20); A. Farnesiana (*c-h, y, sc*; 6-10); A. glauca (*c-h, w*; 5-10); A. mollissima (*c-h, y*; 10-20); Acmena floribunda (*w*; 4); Acridocarpus natalitius (*c-h, y*); Acronychia Cunninghami (*c-h, w*; 7); Adenanthos obovata (*c-h, r*; 5); Adina globiflora (*st, y*; 3-4); Æschynanthus atrosanguinea (*st, r*; 1½); Æ. Boschianus (*st, r*; 1); Æ. longiflorus (*st, r*; 2); Æ. speciosus (*st, o*; 2); Æ. splendidus (*st, r*, spotted *bk*; 1); Æ. tricolor (*st, r, o*, and *bk*; 1); Alona cœlestis (*st, b*; 2); Alonsoa incisifolia (*c-h, r*; 1-2); Ardisia acuminata (*st, w*; 6-8); A. macrocarpa (*st, pi-w*, dotted; 5-6); A. Oliveri (*st, pi* and *w*); A. paniculata (*st, pi*; 8-10); A. serrulata (*st, r*; 2-3); Argyreia capitata (*st, pi*); A. cuneata (*st, p*; 2-5); A. speciosa (*st, pi*; 10); Aristolochia floribunda (*st, p-r* and *y*; 10); A. Goldieana (*i-h, g* and *y*, veined *p*); A. labiosa (*st, g*; 20); A. odoratissima (*st, p, sc*; 10); A. ringens (*st, g*, marbled *bk-p*); Artabotrys odoratissimus (*st, r-br, sc*; 6); Astelma eximium (*c-h, r*; 3); Astephanus triflorus (*c-h, w*); Asystasia scandens (*st, c*; 6); Babingtonia Camphorasmæ (*c-h, pi-w*; 7); Barleria flava (*st, y*; 3); Bauhinia corymbosa (*st, pi*); Begonia cinnabarina (*st, r*; 2); B. coccinea (*st, r*; 2); B. Evansiana (*c-h, pi*; 2); B. falcifolia (*st, r*; 1-2); B. foliosa (*st, w*, tinged *pi*); B. fuchsioides (*st, r*); B. Ingramii (*c-h, pi*; 2); B. Kunthiana (*st, w*); B. maculata (*st*, variable); B. nitida (*st, pi*; 4-5); B. platanifolia (*st, pi-w*; 5-6); Berkheya grandiflora (*c-h, y*; 2); Berzelia lanuginosa (*c-h, w*; 1-2); Bignonia Cherere (*i-h, o*; 10); B. magnifica (*i-h, m* or *p-r*); B. pallida (*i-h, y* and *l*); B. variabilis (*i-h, g-y*; 10); Billardiera longiflora (*c-h, g-y*, turning *p*); B. scandens (*c-h, c*, turning *p*); Borbonia barbata (*c-h, y*; 3-4); B. crenata (*c-h. y*; 3-6); Boronia crenulata (*c-h, r*; 1); B. Drummondi (*c-h, pi*; 2); B. serrulata (*c-h, pi*; 1-6); Bossiæa linophylla (*c-h, o* and *p*; 1-4); Bougainvillea glabra (*c-h, pi*); Bouvardia leiantha (*c-h, r*; 2); B. triphylla (*c-h, r*; 2-3); Brownea coccinea (*st, r*; 6-10); B. grandiceps (*st, r*); Brunfelsia eximia (*st, p, sc*; 2½); Brunia nodiflora (*c-h, w*; 1-3); Bunchosia argentea (*c-h, y*; 10); Bursaria spinosa (*c-h, w*; 10); Burtonia conferta (*c-h, v*; 2); Cajanus indicus (*st, y*; 6-10); Candollea cuneiformis (*c-h, y*; 7); Cassia tomentosa (*st, y*; 5-7); Celastrus lucidus (*c-h, w*; 1-3);

July (Tender Shrubs)—*continued.*

Cereus Macdonaldiæ (*c-h, r* and *o*); C. pentagonus (*c-h, w*; 3); C. speciosissimus (*c-h, r*; 3-6); Cestrum elegans (*c-h, p-r*); C. roseum (*c-h, pi*; 4); Chirita Moonii (*st, b*; 2); C. sinensis (*c-h, l*); Chloanthes stœchadis (*c-h, g-y*; 2); Chorizema diversifolium (*c-h, o-r*; 2); Clavija Reideliana (*st, o*); Clerodendron Bethuneanum (*st, r*, spotted *w* and *p*; 10); C. splendens (*st, r*; 6); C. s. speciosissima (*st, r*); C. squamatum (*st, r*; 10); Clitoria heterophylla (*st, b*; 1); C. ternatea (*st, b*, marked *w*; 4); Cobæa scandens (*c-h, p*; 20); Colutea cruenta (*c-h, r-y*; 4-6); Combretum grandiflorum (*st, r*); C. racemosum (*st, y*); Coronilla coronata (*c-h, y*; 1-2); Cotyledon Peacockii (*c-h, r*; 1); Cowania plicata (*c-h, r*; 1-2); Crassula coccinea (*c-h, r*; 1-3); C. falcata (*c-h, r* or *w*; 3-8); C. versicolor (*c-h, r* and *w*); Crotalaria cajanifolia (*c-h, y*; 4-6); C. Cunninghamii (*c-h, y-g* and *p*; 3); Crowea saligna (*c-h, pi*; 1-2); Cryptostegia grandiflora (*st, r-p*); Cytisus canariensis (*c-h, y*); C. racemosus (*c-h, y*; 3); Dianthus arbusculus (*c-h, p-r*; 1½); Diosma ericoides (*c-h, w* and *r*; 1-3); Dipladenia amabilis (*st, pi-r*; 10); D. amœna (*st, pi*); D. boliviensis (*st, w* and *y*); D. Brearleyana (*st, pi*, becoming *r*); D. carissima (*st, pi*); D. diadema (*st, pi*); D. hybrida (*st, r*); D. insignis (*st, pi-p*); D. nobilis (*st, pi-p*, becoming *o-r*); D. Regina (*st, pi-w*); D. splendens profusa (*st, r*); Dolichos lignosus (*c-h, pi* and *p*); Doryanthes excelsa (*c-h, r*; 8-16); Dracophyllum capitatum (*c-h, w*; 1-1½); Drosophyllum lusitanicum (*c-h, y*); Duvalia polita (*c-h, br-p, br* or *r*, and *o*); Echinopsis cristata (*st, c-w* and *g-p*); Echites atropurpurea (*st, br*); Echium fastuosum (*c-h, b*; 2-4); Elæocarpus grandiflora (*st, y, r*, and *w*; 7); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Erica Aitonia (*c-h, r* or *w*; 2); E. ampullacea (*c-h, r*; 2); E. Austiniana (*c-h, w* and *r*); E. Bergiana (*c-h, p*; 1½); E. Candolleana (*c-h, pi-r* and *w*); E. Cavendishiana (*c-h, y*; 1½); E. cerinthoides (*c-h, r*; 3); E. Devoniana (*c-h, p*); E. elegans (*c-h, pi* and *g*; ½-1); E. Fairieana (*c-h, pi* and *w*); E. grandiflora (*c-h, y*; 3); E. Irbyana (*c-h, w* and *r*; 1-2); E. jasminiflora (*c-h, r*; 1-2); E. Lambertiana (*c-h, w*; 1-2); E. Marnockiana (*c-h, p*); E. Massonii (*c-h, r* and *g-y*; 3); E. McNabiana (*c-h, pi-r* and *w*); E. odorata (*c-h, w, sc*; 1); E. Parmentieriana (*c-h, r-p*; 1); E. propendens (*c-h, p* or *r*; 1); E. ramentacea (*c-h, p-r*; 1½); E. Savileana (*c-h, r* or *p-r*; 1); E. Shannoniana (*c-h, w* and *p*; 1-2); E. tricolor (*c-h, r, w*, and *g-y*; 2); E. Victoria (*c-h, p* and *w*); E. Westphalingia (*c-h, pi-r*); Fuchsia corymbiflora (*c-h, r*; 4-6); F. dependens (*c-h, r*; 2-4); F. fulgens (*c-h, r*; 4-6); F. macrostema (*c-h, r*; 6-12); F. splendens (*c-h, r* and *g*; 6); F. thymifolia (*c-h, r*; 4-6); Gardenia florida Fortunei (*st, w, sc*); Gasteria brevifolia (*c-h, r*); Gazania uniflora (*c-h, y*; 1); Gomphocarpus fruticosus (*c-h, w*; 5-7); Gompholobium polymorphum (*c-h, r* and *y, p* outside); G. venustum (*c-h, p*; 1-3); Goodia lotifolia (*c-h, y* and *r*; 2-4); G. pubescens (*c-h, y* and *r*; 1-3); Grewia occidentalis (*c-h, p*; 10); Guettarda odorata (*st, r, sc* at night; 6-10); Hakea dactyloides (*c-h, w*; 7); H. suaveolens (*c-h, w*; 4); Heliotropium corymbosum (*c-h, l*; 4); Hermannia flammea (*st, o* or *r*; 1-3); Hibbertia dentata (*c-h, y*); H. perfoliata (*c-h, y*); Houttea Gardneri (*st, r*; 2); Hoya carnosa (*i-h, pi-w*); H. cinnamomifolia (*i-h, y-g*; 10); H. Cumingiana (*st, g-y* or *w*, and *p-br*); H. pallida (*st, y* or *y-w*, and *pi, sc*); Hypericum balearicum (*c-h, y*; 1-2); Hypocalyptus obcordatus (*c-h, p*; 1-2); Indigofera tinctoria (*st, r*; 4-6); Iochroma fuchsioides (*c-h, o-r*; 5); I. lanceolata (*c-h, p-b*; 4-5); Ixora chelsoni (*st, o-pi*); I. coccinea (*st, r*; 3-4); I. javanica (*st, o*; 3-4); Jasminum grandiflorum (*i-h, w*); J. Sambac (*st, w, sc*); Jatropha podagrica (*st, o-r*; 1½); Justicia ventricosa (*st, pi*; 3); Lachnæa buxifolia (*c-h, w*; 2); L. purpurea (*c-h, p*; 2); Lagerströmia indica (*st, pi*; 6-10); Lapageria rosea (*c-h, pi-r*); Leschenaultia biloba (*c-h, b*; 1); L. formosa (*c-h, r*; 1); Leucopogon verticillatus (*c-h, w* or *pi*; 3-6); Lightfootia ciliata (*c-h, b*; ¾); Lippia citriodora (*c-h, w*; 3); Lonicera sempervirens (*c-h; r* and *y*); Luculia Pinceana (*c-h, w, sc*); Mahernia incisa

July (Tender Shrubs)—*continued.*

(*c-h*, *r*, becoming *y*; 2-4); Melianthus major (*c-h*, *br*; 4-6); Mesembryanthemum candens (*c-h*, *w*); M. coccineum (*c-h*; *r*); M. multiflorum (*c-h*, *w*; 2-3); M. spectabile (*c-h*, *r*; 1); M. violaceum (*c-h*, *pi-w* to *v*, 1-2); Mimulus glutinosus (*c-h*, *br* or *pi*; 5); Myrtus Luma (*c-h*, *w*; 3); Nerium Oleander (*c-h*, *r*; 6-14); Opuntia arborescens (*c-h*, *p*; 5); O. echinocarpa (*c-h*, *g-y*); O. multiflora (*c-h*, *y*); O. Tuna (*c-h*, *r-o*); Osbeckia glauca (*st*, *r* or *p*; 2); Oxyanthus tubiflorus (*st*, *w*; 3-4); Oxylobium Callistachys (*c-h*, *y*; 3-4); O. ellipticum (*c-h*, *y*; 2-3); Oxypetalum cæruleum (*i-h*, *b*); Pachypodium succulentum (*st*, *r* and *w*); Passiflora alata (*st*, *r*, *p*, and *w*, *sc*); P. cæruleo-racemosa (*c-h*, *p*); P. coccinea (*st*, *r* and *o*); P. edulis (*st*, *p-w*, *sc*); P. Hahnii (*c-h*, *w* and *y*); P. racemosa (*st*, *r*); Pelargonium ardens (*c-h*, *r*; 1-1½); P. betulinum (*c-h*; 3); P. bicolor (*c-h*, *p*; 1-2); P. comptum (*c-h*, *pi* and *p*); P. fragrans (*c-h*, *w* and *r*; 2); P. ignescens (*c-h*, *r*; 1½); P. inquinans (*c-h*, *r* or *pi*, and *w*; 2); P. peltatum (*c-h*, *w* or *r*; 2); P. tricolor (*c-h*, *w* and *r*; 1½); Pentas carnea (*st*, *pi-w*; 1½); Petræa volubilis (*st*, *p*; 20); Phænocoma prolifera (*c-h*, *r*; 4); Phyllanthus Chantrieri (*st*, *r* and *y*); P. pallidifolius (*st*, *y* and *r*); Phyllocactus Ackermanni (*st*, *pi*); Physianthus albens (*c-h*, *w* and *r*); Pitcairnia aphelandræflora (*st*, *r*); Plagianthus Lyallii (*c-h*, *w*; 20); Platylobium formosum (*c-h*, *y*; 4); Plumbago capensis (*i-h*, *b*; 2); Podalyria calyptrata (*c-h*, *p*; 6); Podanthes geminata (*st*, *o-y* and *r-p*); Portlandia platantha (*st*, *w*; 3); Psoralea aculeata (*c-h*, *b* and *w*; 2-3); P. pinnata (*c-h*, *b*; 3-6); Pultenæa stricta (*c-h*, *y*; 1-3); Quisqualis indica (*st*, variable); Rhododendron javanicum (*c-h*, *o* and *r*; 4); Rhus succedanea (*c-h*, *g-y*; 10-15); Rondeletia cordata (*st*, *pi*; 4); R. Purdiei (*st*, *y*, *sc*; 4); Ruellia macrophylla (*i-h*, *r*; 3-4); R. speciosa (*i-h*, *r*; 20); Russelia juncea (*st*, *r*; 3-4); R. sarmentosa (*st*, *r*; 4); Salvia albo-cærulea (*c-h*, *w* and *b*; 3); S. chamædryoides (*c-h*, *b*; 1); S. fulgens (*c-h*, *r*; 2-3); S. Goudotii (*c-h*, *r*; 2); S. Grahami (*c-h*, *p-b*; 2); S. Heerii (*c-h*, *r*; 2-3); S. rutilans (*c-h*, *r*; 2-3); Sarmienta repens (*c-h*, *r*); Satyrium aureum (*i-h*, *o* and *r*; 1-1½); Scutellaria Hartwegi (*st*, *r* and *v*; 1); S. Mociniana (*st*, *r* and *y*; 1½); Selago Gillii (*c-h*, *pi*; ½); Sempervivum aureum (*c-h*, *y*; 1); S. canariense (*c-h*, *w*; 1½); S. tabulæforme (*c-h*, *y*; 1); Senecio argenteus (*c-h*, *y*; 1-2); S. chordifolia (*c-h*, *y*; 1); S. macroglossus (*c-h*, *y*); Siphocampylos coccineus (*st*, *r*; 3); Solandra viridiflora (*st*, *g-w*; 2-3); Solanum atropurpureum (*c-h*, *p* and *y*); S. Capicastrum *c-h*, *w*); S. giganteum (*c-h*, *b*; 10-25); S. jasminoides (*c-h*, *b-w*) and var; S. marginatum (*c-h*, *w* and *p*; 3-4); S. maroniense (*st*, *b-v*; 6-14); S. Pseudo-capsicum (*c-h*, *w*; 4); S. pyracanthum (*c-h*, *b-v*; 3-6); S. Seaforthianum (*st*, *r* or *l*); Sphæralcea elegans (*c-h*, *v* and *p*); S. miniata (*c-h*, *r*; 1); Stachytarpheta mutabilis (*st*, *r*; 3); Steriphoma cleomoides (*i-h*, *y*; 6); Styphelia tubiflora (*c-h*, *r*; 5); Tabernæmontana Barteri (*st*, *w*; 6); T. coronaria (*st*, *w*; 4) and vars; Tacsonia insignis (*i-h*, *r*, *v-r*, and *w*); T. manicata (*st*, *r* and *b*); T. Van Volxemii (*i-h*, *r*); Talinum Arnotii (*c-h*, *y*); Tephrosia capensis (*c-h*, *p*); Testudinaria elephantipes (*c-h*, *g-y*; 10); Tetratheca pilosa (*c-h*, *p*; 1-1½); Teucrium fruticans (*c-h*, *b*; 2-3); Thyrsacanthus bracteolatus (*st*, *r*; 2); T. callistachyus (*st*, *r*; 2); Trachelospermum jasminoides (*i-h*, *w*); Ursinia crithmifolia (*c-h*, *y*; 1-2); U. pulchra (*c-h*, *o*; 1); Vaccinium caracasanum (*c-h*, *r-w*; 4); V. leucobotrys, (*c-h*, *w*; 4-7); Westringia rosmariniformis (*c-h*, *b*); Yucca Treculeana (*c-h*, *w*; 20-25).

AUGUST.—Hardy.—ANNUALS.—Acroclinium roseum (*pi*; 1-2) and vars.; Agrostemma cœli-rosa (*pi*, *w*, or *p*; 1); Amarantus caudatus (*p* or *y*; 2-3); Anagallis grandiflora (*b* and *r*; ¼); Androsace lanuginosa (*pi*; ½-¾); Argemone albiflora (*w*; 1); A. hirsuta (*w*; 2); A. ochroleuca (*y*); Bellium bellidioides (*w*; ¼); Brachycome iberidifolia (*b* or *w*; 1); Calendula maderensis (*o*; 2); C. officinalis (*o*; 3); Campanula Erinus (*b-pi* or *w*; ¼-½); Chrysanthemum carinatum (*w* or *p*; 2); C. coronarium (*y*; 4); C. segetum (*y*; 1½); Clarkia elegans (*r*; 2); C. pulchella (*p*; 1½-2); Collinsia bicolor (*w* and *pi-p*; 1); Collomia coccinea (*r*; 1-1½); C. grandiflora (*r-y*; 1½-2); Convolvulus tricolor (*y*, *b*, and *w*; 1); Coreopsis Drummondi (*y* and *r-br*; 1); Delphinium Ajacis (*b*, *r*, or *w*; 1-1½); D. cardinale (*r* and *y*; 3-4); Downingia elegans (*b* and *w*; ½); D. pulchella (*b* and *y*; ½); Drosera rotundifolia (*w*; ¼); Eschscholtzia californica (*y*; 1½); E. c. crocea (*o*; 1); Eucharidium concinnum (*l-p*; 1); Fumaria capreolata (*w* and *p*; 4); Gilia achilleæfolia (*p-b*; 1); G. androsacea (*l*, *pi* or *w*, and *y*; ¾-1); G. capitata (*b*; 1-2); G. liniflora (*w*; 1); G. micrantha (*pi*; ¾); Helianthus annuus (*y*; 6); Helichrysum bracteatum (variable; 3-4); Heliotropium convolvulaceum (*w*, *sc*; 2); Iberis umbellata (variable; ½-1); Impatiens amphorata (*p* and *pi-r*; 3-6); I. Roylei (*p*; 10); Ionopsidium acaule (*l*, or *w* and *v*; ¼); Ipomœa purpurea (*p*; 10); Lathyrus grandiflorus (*pi*); L. odoratus vars. (*sc*); Lavatera trimestris (*pi*; 3-6); Limnanthes Douglasii (*y* and *w*, *sc*; ¾); Linaria spartea (*y*); Loasa prostrata (*y*); L. vulcanica (*w*; 2); Lopezia coronata (*pi-p*; 1½); Lupinus luteus (*y*, *sc*; 1-1½); L. nanus (*l* and *b*; 1); Madia elegans (*y*; 1½); Malcolmia maritima (*l*, *pi*, *r*, or *w*; ½-1); Malope trifida (*p* or *w*; 1); Mathiola annua (variable; 1-2); Nemesia cynanchifolia (*l-b*; 1½-2); N. floribunda (*w* and *y*, *sc*; 1); Nemophila insignis (*b*; 1½); N. maculata (*w* and *v-p*; ½); N. Menziesii (*w* to *b*; ¼); Nicandra physaloides (*b*; 2); Nigella damascena (*w* or *b*; 1-2); N. hispanica (*b*; 1-2); N. orientalis (*y* and *r*; 1½); Nolana paradoxa (*v*); N. tenella (*b*); Nonnea rosea (*pi*; ½-1); Œnothera amœna (*pi* and *r*; 1-2); Œ. bistorta Veitchiana (*y* and *r*); Œ. Whitneyi (*pi-r* and *r*; 1-1½); Œ. varieties; Omphalodes linifolia (*w*; ½-1); Oxalis stricta (*y*; 1½); O. valdiviensis (*y* and *r*; ½-¾); Papaver alpinum (*y*; ½); P. nudicaule (*o*, *y*, or *w*; ¾-1½); P. pilosum (*r* or *o*, and *w*; 1-2); P. Rhœas (*r*; 1) and vars.; Podolepis aristata (*y* and *pi*; 1); Polygonum orientale (*pi-p* or *w*; 3-4); Ranunculus anemonoides (*pi-w*; ¼-½); Reseda odorata (*y-w*, *sc*) and vars.; Sabbatia calycosa (*w*; ½-1¾); S. campestris (*pi*; 1); Scabiosa atropurpurea (*r*, *sc*; 2-3); Schizanthus pinnatus (variable; 2); Silene pendula (*pi-w*); Sonchus gummifer (*y*; 2-3); Statice Suworowi (*l*); Streptanthus maculatus (*p*; 1½); Tagetes patula (*o-y*; 1½); T. tenuifolia (*y*; 2); Tropæolum peregrinum (*y*); Wahlenbergia hederacea (*b*).

BIENNIALS.—Anagallis fruticosa (*r*; 2); Dianthus chinensis (variable; ½-1); Digitalis purpurea (*p*, varying to *w*; 3-5); Glaucium flavum (*y*; 1-2); Grindelia grandiflora (*y* or *o*; 2½-3); Hesperis tristis (*w*, *c*, *br-r*, or *p*, *sc* at night; 1-2); Michauxia lævigata (*w*; 11); Œnothera biennis (*y*, *sc*; 2-4); Silybum Marianum (*pi-p*; 1-4); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Acantholimon glumaceum (*pi*; ½); A. venustum (*pi*; ½-¾); Acanthus mollis (*w*; 3-4); A. montanus (*pi*; 3); A. spinosus (*pi*; 3-4); Achillea ægyptiaca (*y*; 1½-2½); A. Ageratum (*w*; ½); A. asplenifolia (*pi*; 1½); A. atrata (*w*); A. aurea (*y*; 1½); A. Clavennæ (*w*; ¾); A. Eupatorium (*y*; 4-5); A. Millefolium roseum (*pi*; 1-3); A. serrata (*w*; 1¼); Acis grandiflorus (*w*; ½); A. roseus (*pi*; ¼); Aconitum album (*w*; 4-5); A. chinense (*b*; 4-6); A. japonicum (*pi-w*; 6); A. Napellus (*b*; 3-4); A. Ottonianum (*b* and *w*; 2-4); A. paniculatum (*v*; 2-3); Acorus Calamus (*y*; 3); Actinella grandiflora (*y*; ½-¾); Actinomeris helianthoides (*y*; 3); A. squarrosa (*y*; 3); Adenophora Fischeri (*b* or *w-b*, *sc*; 1½); Aletris farinosa (*w*; 1½-2); Allium azureum (*b*; 1-2); A. falcifolium (*y*; 1); A. nigrum (*v* or *w*; 2½-3¼); Alströmeria aurantiaca (*o*; 3-4); A. chilensis (*p-r* or *pi*; 2-3); A. versicolor (*y* and *p*; 2-4); Althæa narbonensis (*r*; 3-6); Alyssum Wiersbeckii (*y*; 1½); Amsonia salicifolia (*b*; 1½-2½); A. Tabernæmontana (*b*; 1½-2½); Anomatheca cruenta (*r*; ½-1); Antennaria margaritacea (*w*; 2); Anthemis Aizoon (*w* and *y*; ¼); Anthyllis Vulneraria (*w*, *y*, *r*, or *pi*); Apios tuberosa (*br-p*, *sc*; ½); Aquilegia californica (*y* and *o-r*; 2-4); A. chrysantha (*y* and *p*; 3-4); A. pyrenaica (*l-b*; ¾-1); A. sibirica (*l*; 1);

August (Hardy Annuals)—*continued.*

August (Hardy Perennials)—*continued.*

Arabis lucida (*w*; ¼-½) and vars.; Arenaria balearica (*w*; ¼); A. rotundifolia (*w*; ¼-½); Arnica Chamissonis (*y*; 1-2); A. foliosa (*y*; 1-2); A. scorpioides (*y*; ½-1); Artemisia alpina (*y*; ½-¾); A. cana (*y*; 2-3); A. Stelleriana (*y*; 1-2); A. vulgaris (*y*; 3-4); Asclepias tuberosa (*o*; 1-2); Asperula longiflora (*w*, *y*, and *r*; ½); A. orientalis (*b*; 1); Aster Amellus (*p*; 2) and vars.; A. argenteus (*p*; 1); A. Bigelovii (*l* and *y*; 2½); A. Douglasii (*p*; 3-4); A. hyssopifolius (*w*; 1½-2); A. peregrinus (*b-p*; 1); A. spectabilis (*b*; 2); A. Tradescanti (*w*; 3); A. versicolor (*w*; 3); Astilbe rivularis (*y-w* or *r*; 3); Astragalus leucophyllus (*y*; 2-3); Bellium minutum (*w* and *y*; ½); Bessera elegans (*r*, or *r* and *w*; 2); Bocconia cordata (buff; 5-8); Boltonia asteroides (*pi-w*; 2); Borago laxiflora (*b*); B. longifolia (*b*; 1); B. officinalis (*b*; 1-2); Brodiæa congesta (*b*; 1); B. grandiflora (*b-p*; 1½); B. Howellii (*p-b*; 1½-2); Butomus umbellatus (*aq*, *pi*); Callirhoe digitata (*r-p*; 2-3); C. involucrata (*r*; ½); C. Papaver (*v-r*; 3); Calochortus albus (*w*, blotched *r*; 1-1½); C. Benthami (*y*; ½-¾); C. lilacinus (*pi*; ½-¾); C. purpureus (*p*, *y*, and *g*; 3); C. splendens (*l*; 1½); Calophanes oblongifolia (*b*; 1); Calopogon pulchellus (*p* and *y*; 1½); Calypso borealis (*pi*, *br*, and *y*; 1); Campanula Allionii (*b* or *w*; ¼); C. cæspitosa (*b* or *w*; ¼-½); C. carpathica (*b* or *w*; ¾) and vars.; C. Elatines (*b-p*; ¼-½); C. fragilis (*l-p*; ¼-½); C. garganica (*b*; ¼-½); C. glomerata (*b-v* or *w*; 1-2) and vars.; C. isophylla (*l-b*) and vars.; C. lactiflora (*b-w* or *b*; 2-6); C. nitida (*b* or *w*; ¼-¾); C. pusilla (*b* and *w*, or *w*; ¼-½); C. rotundifolia (*b*; ½-1) and vars.; C. Scouleri (*b*; 1); C. Tommasiniana (*b*; ¾-1); C. Van Houttei (*b*; 2); Cassia marylandica (*y*; 2-3); Centaurea atropurpurea (*p*; 3); C. aurea (*o-y*; 2); C. dealbata (*pi*; 1-1½); Centranthus ruber (*r*; 2-3); Cerastium Boissieri (*w*; ¼-1); Cheiranthus Cheiri (variable, *sc*; 1-2); Cheloni Lyoni (*p*; 3-4); Cimicifuga americana (*w*; 2-3); C. racemosa (*w*; 3-5); Cineraria maritima (*y*; 2); Clematis recta (*w*, *sc*; 2-3); Cnicus acaulis (*p*; 2); C. altissimus (*p*; 3-10); C. spinosissimus (*y*; 3); C. undulatus (*p*; 1); Commelina virginica (*b*; ½); Coreopsis auriculata (*y* and *p-br*; 1-1½); C. grandiflora (*y*; 3-4); C. lanceolata (*y*; 1-3); C. verticillata (*y*; 1-2); Coris monspeliensis (*l*; ½); Coronilla varia (*pi* and *w*, or *w*; 1); Crinum capense (*r*); Cynanchum roseum (*pi-r*; 1-1½); Delphinium exaltatum (*b* or *w*; 3-6); D. formosum (*b* and *v*; 1½-3); D. nudicaule (*r* and *y*; 1-1½); Dianthus arenarius (*w*); D. atrorubens (*r*; 1); D. barbatus vars.; D. cæsius (*pi*, *sc*; ¼-½); D. cruentus (*r*); D. fimbriatus (*pi*; 1); D. Fischeri (*pi*); D. fragrans (*w* and *p*, *sc*; ½-¾); D. glacialis (*r-p*; ¼); D. monspessulanus (*r*; ½-1); D. neglectus (*pi*; ¼); D. petræus (*pi*; ½); D. plumarius (*w* and *p*, *sc*; ¾-1); D. Seguierii (*pi-p*; 1); D. superbus (*pi*, *sc*; ¾-1½); and var.; Dicentra eximia (*r-p*; ¾-1½); D. spectabilis (*pi-r*; ¾-2); Digitalis ambigua (*y* and *br*; 2-3); Diphylleia cymosa (*w*; 1); Doronicum plantagineum excelsum (*y*; 5); Drosera filiformis (*p*; 1); Echinops commutatus (*w*; 5-7); E. Ritro (*b*; 3); Epilobium obcordatum (*pi-p*); Epimedium macranthum (*w*; 10-15); E. pinnatum (*y*; 8-12); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Erodium Manescavi (*p-r*; 1-2); E. pelargoniiflorum (*w* and *p*); E. trichomanefolium (*pi-w*; ¼-½); Eryngium alpinum (*b*; 1½-2); E. amethystinum (*b*; 1-2); E. Bourgati (*b*; 1-2); E. giganteum (*b*; 3-4); Erysimum pumilum (*g-y*, *sc*; ¼); Fœniculum vulgare (*y*); Fritillaria Hookeri (*l*; ½); Funkia grandiflora (*w*, *sc*); F. subcordata (*w*); Galega officinalis (*b*; 3-4); G. orientalis (*b*; 2-4); Galtonia candicans (*w*, *sc*); Gentiana affinis (*b*; ½-1); G. Andrewsii (*b*; 1-2); G. Pneumonanthe (*b*; ½-1); Globularia nana (*b*); G. nudicaulis (*b*; ½); G. vulgaris (*b*; ½); Glycyrrhiza glabra (*b*; 3-4); Habenaria fimbriata (*l-p*; 1-1½); Hablitzia tamnoides (*g*); Hedysarum coronarium (*r*; 3-5); Helianthus rigidus (*y* and *br*; 3); Helichrysum arenarium (*y*; ½-1); Hemerocallis Dumortieri (*o-y*; 1-1½); H. flava (*o-y*, *sc*; 2-3); H. fulva (*y*; 2-4); H. Middendorfii (*y*; 2-3); H. minor (*y*, *sc*; ¼-¾); Hesperis matronalis (variable; 2-3); Heuchera americana (*r*; 1½); H. sanguinea (*r*; ¾-1½); H. villosa (*v*; 1-3); Houstonia serpyllifolia (*w*; ¼); Humulus Lupulus (*g-y*); Hypericum elegans (*y*; 1); H. patulum (*y*; 6); H. perforatum (*y*; 1-3); Incarvillea Olgæ (*pi*; 3-4½); Inula glandulosa (*y*; 2); Iris iberica (*w* or *l*, *p*, and *p-br*; ¼-½); Kniphofia aloides (*r*, fading to *o* and *g-y*; 3-4); K. Leichtlinii (*r* and *y*); Lamium maculatum (*p*); Lathyrus magellanicus (*b-p*); L. roseus (*pi*); L. sylvestris platyphyllus (*pi*); Lavandula vera (*b* or *w*; 1-2); Leucoium Hernandezii (*w* and *g*; 1-1½); Lilium auratum (*w*, *y*, and *p*; 2-4); L. bulbiferum (*r*; 2-4); L. canadense (*y* or *r*, and *p*; 1½-3); L. Catesbæi (*o-r* and *p*; 2-3); L. chalcedonicum (*r*; 2-3); L. cordifolium (*w*, *y*, and *p*; 3-4); L. Leichtlinii (*y*, *p*, and *r*; 2-3); L. Martagon (*p-r* and *p*; 2-3); L. pardalinum (*o-r* and *p*; 3-7); L. Parryi (*y* and *br-r*, *sc*; 2-6); L. philadelphicum (*o-r* and *p*; 1-3); L. pomponium (*r* or *r-o*; 1½-3); L. pyrenaicum (*y*; 2-4); L. speciosum (*w*, or *p-r* and *w*; 1-3); L. superbum (*o-r*; 4-6); L. tenuifolium (*r*; ½-1); L. tigrinum (*o-r* and *p-bk*; 2-4) and vars.; L. Washingtonianum (*w*, and *p* or *l*, *sc*; 3-5); Limnanthemum nymphæoides (*aq*, *y*); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); L. dalmatica (*y*; 3-4); L. hepaticæfolia (*l-p*; ¼); L. purpurea (*b-p*; 1-3); L. triornithophora (*p* and *y*); Linum alpinum (*b*; ½); Lithospermum Gastoni (*b*; 1-1½); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus lepidus (*p-b*; ½); L. leucophyllus (*pi*; 2-3); L. ornatus (*b*; 1-2); L. polyphyllus (*b*; 4); Lychnis alpina (*pi*; ½); L. chalcedonica (*r*; 1½-3½); L. diurna (*p-pi*; 1-3); L. fulgens (*r*; ½-1); L. f. Haageana (*r*); L. Lagascæ (*pi* and *w*; ½); L. pyrenaica (*pi-w*; ¼); L. vespertina (*w*, *sc* at evening; 1-3); L. Viscaria (*pi*; 1); Lysimachia atropurpurea (*p*; 2); L. clethroides (*w*; 3); L. Nummularia (*y*); L. punctata (*y*; 1); L. vulgaris (*y*; 2-3); Malva Alcea fastigiata (*r*; 2-3); M. moschata (*pi*; 2-2½); Meconopsis cambrica (*y*; 1); Mertensia alpina (*b*; ½-¾); M. virginica (*p-b*; 1-2); Milla biflora (*w* and *g*; ½); Mimulus cardinalis (*r*; 1-3); M. Lewisii (*pi*; 1); M. luteus (*y*; ¾-1); M. l. cupreus (*r-br*, *p-br*, or *r*; ¾-1); M. moschatus (*y*); Mitchella repens (*w* and *p*, *sc*); Mœhringia muscosa (*w*; ¼); Monarda didyma (*r*; 1½); M. fistulosa (*p*; 2-5); Mutisia decurrens (*o*); Myosotis alpestris (*b*, *sc* at night; ¼); Nothoscordum fragrans (*w*, *sc*; 1¼-2); Nuphar advena (*aq*, *r*); N. luteum (*aq*, *y*, *sc*); Nymphæa alba (*aq*, *w*); N. odorata (*aq*, *w*, tinged *r*, *sc*); N. pygmæa (*aq*, *b*, *sc*); Œnothera acaulis (*w*, turning *r*; ½); Œ. glauca (*y*; 1-2); Œ. g. Fraseri (*y*; 1); Œ. linearis (*y*; ¾-1½); Œ. pallida (*w* and *y*, turning *r*; 1½); Œ. speciosa (*w*, turning *r*; 2-3); Œ. taraxacifolia (*w*, turning *r*; ½); Omphalodes Luciliæ (*l-b*; ¼-½); Ononis Natrix (*y*; 1½-2); O. rotundifolia (*pi*; 1-1½); Onosma stellulatum tauricum (*y*; ½-¾); Ornithogalum arabicum (*w* and *bk*, *sc*; 1-2); O. pyramidale (*w*; 1½-2); Ourisia coccinea (*r*; ½-1); Oxalis Bowiei (*pi-r* and *y*; ½-¾); O. corniculata (*y*); Oxytropis Lambertii (*pi-r*; ½-1); Pedicularis dolichorhiza (*o-y*; 1-1½); P. Sceptrum-Carolinum (*o-y* and *p*; 3-4); Pentstemon antirrhinoides (*y*; ¾-1½); P. azureus (*b*; 1); P. glaber (*p*, *v*, or *b*; ½-1); P. gracilis (*l-p* or *w*; 1); P. Murrayanus (*r*; 2-3); P. pubescens (*v* or *p*; 1-3); Phlomis herba-venti (*p-v*; 1-1½); Phlox paniculata (*pi-p* or *w*; 3-4); Phormium Cookianum (*y*; 3-6) and var.; P. tenax (*y* or *r*) and vars.; Phytolacca decandra (*w*; 3-10); Pinguicula grandiflora (*v-b*); Podolepis gracilis (*p*, *l*, or *w*; 3); Polemonium confertum (*b*; ½); Polygonum cuspidatum (*c-w*; 4-8); P. sachalinense (*g-y*; 10-12); P. vaccinifolium (*pi*); Potentilla alba (*w* and *o*); P. argyrophylla (*y*; 1½-3); P. congesta (*w*; 1-2); P. nitida (*pi*); Pratia angulata (*w*; ¼); P. repens (*v-w*; ¼); Prenanthes purpurea (*p*; 4); Primula luteola (*y*; 1½-2); P. minima (*pi* or *w*); P. obconica (*w*; ½-1); P. sikkimensis (*y*; 1½-2); Pyrethrum achilleæfolium (*y*; 2); P. uliginosum (*y* and *w*; 5); Pyrola rotundifolia (*w*, *sc*; ½); Rudbeckia maxima (*y*; 4-9); R. speciosa (*o*; 2-3); Salvia Sclarea (*b-w*; 2-3); Saponaria officinalis (*l* or *w*; 1-2); Saxifraga cæspitosa (*w*; ¼); S.

August (Hardy Perennials)—*continued.*

August (Hardy Perennials)—*continued.*

Hirculus (*r*; ½); S. Rocheliana (*w*; ¼) and var.; S. sancta (*y*); Scabiosa caucasica (*b*; 1); Scilla hyacinthoides (*bl-l*; 1-2); Scorzonera hispanica (*y*; 3); Scutellaria alpina (*p* and *y*) and var.; S. orientalis (*y* and *p*); Sedum Aizoon (*y*; 1); S. album (*w*; ¼-½); S. Ewersii (*pi* or *v*); S. japonicum (*y*); S. lydium (*pi*); S. maximum (*w-r*; 1-2) and vars.; S. reflexum (*y*); S. Rhodiola (*g* or *r-p*); Sempervivum arenarium (*y*; ½-¾); S. atlanticum (*r*; 1); S. calcaratum (*r-w*; 1); S. calcareum (*g-r*; 1); S. Heuffelii (*r-br* and *y*; ½-¾); S. Lamottei (*pi* and *p*; 1); S. soboliferum (*y*; ½-¾); S. Wulfeni (*y* and *m-p*; ½-¾); Senecio Doria (*y*; 4); S. Doronicum (*y*; 1); S. pulcher (*p* and *y*; 1-2); Sida Napæa (*w*; 4-10); Silene acaulis (*pi* or *w*; ¼); S. maritima (*w*); S. Saxifraga (*y*; ¼-½); S. Schafta (*p*; ½); S. virginica (*r*; 1-2); Solanum crispum (*b-p*; 12-14); Solidago Drummondii (*y*; 1-3); Spiræa palmata (*r*; 1-2); S. Ulmaria (*w*; 2-4); Symphyandra Wanneri (*b*; ½); Trifolium Lupinaster (*p*; 1-1½); T. uniflorum (*b* and *p*; ¼); Trollius europæus (*y*; ½-2); Veronica spicata (*b* and *p*; ½-1½); V. virginica (*w* or *b*; 2-6); Viola Riviniana (*b-p* or *l*); V. rothomagensis (*b* striped *bk*); V. tricolor (*p*, *w*, or *o-y*; ¼-1½); Wahlenbergia Kitaibelii (*p-b*; ½).

Shrubs.—Abutilon striatum (*o-y*; 10); Actinidia Kolomikta (*w*); Æthionema grandiflorum (*pi*; 1½); Albizzia Julibrissin (*w*; 30-40); Artemisia Abrotanum (*y*, *sc*; 2-4); Asclepias Douglasii (*p-l*; 2-3); Benthamia fragifera (*w*; 10-15); Bignonia capreolata (*o*; 20); Calluna vulgaris (variable; 1-3); Calycanthus occidentalis (*r*; 6-12); Clematis Flammula (*w*, *sc*; 20); C. florida (*w*; 10); C. graveolens (*y*; 15); C. paniculata (*w*, *sc*; 20); C. virginiana (*w*, *sc*; 15-20); C. Vitalba (*w*, *sc*; 8); C. Viticella (*b*, *p*, or *pi*; 20); Clethra acuminata (*w*, *sc*; 10-15); C. alnifolia (*w*; 3-4); C. paniculata (*w*, *sc*; 3-4); C. tomentosa (*w*; 3-4); Colutea arborescens (*y*; 6-10); Convolvulus cantabricus (*r*; ½-1); Cornus paniculata (*w*; 4-8); Cotyledon Sempervivum (*r*; ¼-½); Dabœcia polifolia (*w*, *pi*, or *p*; 1-2); Erica ciliaris (*r*; 1); E. vagans (*p-r*; 1); Helianthemum argenteum (*y* and *bk*; 4); H. halimifolium (*y*; 3-4); H. vulgare (*y*); Hibiscus syriacus (variable; 6); Hydrangea hortensis (variable; 2-3); H. paniculata grandiflora (*w*); Hypericum calycinum (*y*; 1); Iberis saxatilis (*w*; ¼-½); I. sempervirens (*w*; ¾-1); Jasminum officinale (*w*, *sc*); Kalmia latifolia (*pi*, varying to *w*; 3-10); Kerria japonica (*o-y*; 3-4); Ligustrum Ibota (*w*); L. Massalongianum (*w*, *sc*; 6); L. ovalifolium (*w*); Lithospermum prostratum (*b* and *r-v*); Lonicera Periclymenum (*r*); Lupinus arboreus (*y*, *sc*); Lycium barbarum (*p* and *y*); Margyricarpus setosus (*g*; 2-4); Olearia Haastii (*w*); Osmanthus fragrans (*y* or *w*; 6-10); Passiflora cærulea (*b*, *w*, and *p*, *sc*); Rhexia ciliosa (*p*; 1-1½); R. virginica (*p*; ½-1); Rhododendron caucasicum (*pi*; 1) and vars.; Rosa canina (*pi*; 6-8) and vars.; R. indica (*r*; 4-20); R. moschata (*y-w*; 12); R. sempervirens (*w*, *sc*) and vars.; R. varieties (*sc*); Rubus fruticosus (*w* or *pi*); R. laciniatus (*w* or *pi*); Salvia ringens (*r-p*; 1-2); Solanum acanthodes (*b-p*; 3-6); Spartium junceum (*y*, *sc*; 6-10); Spiræa Douglasii (*pi*; 3); Symphoricarpus occidentalis (*pi-w*); S. racemosus (*pi*; 4-6); Tamarix gallica (*w* or *pi*; 5-10); T. parviflora (*pi*); Tecoma radicans (*r*; 25); Veronica Lyallii (*w* and *pi*); V. Traversii (*w*; 2½); Vitex Agnus-castus (*l*; 6); Wistaria chinensis (*b*); W. japonica (*w*); Zenobia speciosa (*w*; 2-4).

Half-hardy.—Annuals.—Calandrinia grandiflora (*pi*; 1); C. Menziesii (*p-r*; ¼); C. umbellata (*m-r*; ½); Castilleja lithospermoides (*r*; 1); Grammatocarpus volubilis (*y*); Ipomœa hederacea (*b*; 10); Maurandya Barclayana (*v-p* and *g*); Mentzelia bartonioides (*g-y*); M. ornata (*w*, *sc*; 2); Nicotiana acutiflora (*w*; 1-2); N. longiflora (*w*, and *p* or *y-g*; 3); N. suaveolens (*w*, *sc*; 1-2); N. Tabacum (*pi*; 4); Pennisetum longistylum (*p-w*; 1-1½); Perilla ocimoides-crispa (*w*; 1-3); Phlox Drummondii (*r*, *pi*, *p*, or *w*; 1) and vars.; Salpiglossis sinuata (*p* and *y*; 2) and vars.; Schizanthus Grahami (*l* or *pi*, and *y*; 2); Schizopetalon Walkeri (*w*; 1-2); Zinnia elegans and vars.

August (Half-hardy)—*continued.*

Biennials.—Lobelia vars.; Mathiola incana (*p*; 1-2).

Perennials.—Alströmeria Pelegrina (*w* or *y*, striped *pi*; 1); Amphicome arguta (*r*; 3); A. Emodi (*pi* and *o*; 1-1½); Arctotis acaulis (*y* and *r*; ¼); Calceolaria arachnoidea (*p*; 1); C. Fothergillii (*y*, spotted *r*; ¼-½); C. plantaginea (*y*; 1); Cœlestina ageratoides (*b*; 1); Conandron ramondioides (*w*, or *pi* and *p*; ½); Crocosmia aurea (*o-r*; 2); Erodium Reichardi (*w* and *pi*; ¼); Eucomis bicolor (*g* and *p*); Francoa ramosa (*w*; 2-3); Hedychium Gardnerianum (*g-y*, *sc*; 3-5); Heteranthera limosa (*aq*, *v-b*); Lilium giganteum (*w*; 4-10); L. japonicum (*w*; 1-2); Linum flavum (*y*; 1-1½); L. Macræi (*o*; 1); Lobelia cardinalis (*r*; 1-2); L. fulgens (*r*; 1-2); L. splendens (*r*; 1-2); Maurandya scandens (*p-v*); Myosotis azorica (*p*, becoming *b*; ½-¾); Neja gracilis (*y*; 1); Nierembergia gracilis (*w*, *p*, and *y*; ½-1); Ophiopogon japonicus intermedius (*l*; 1½); Petunia intermedia (*y*; 1); P. nyctaginiflora (*w*; 2); P. violacea (*p-v*; 1½); Romneya Coulteri (*w*; 2-4); Sedum Sieboldi (*pi*; ¾); Statice sinuata (*p-y*; 1); Tropæolum tricolorum (*o-r*, tipped *bk* and *y*); Verbena venosa (*l* or *p*; 2).

Shrubs.—Calceolaria bicolor (*y* and *w*; 2-3); C. hyssopifolia (*y*; 1-2); C. scabiosæfolia (*y*); Cassia corymbosa (*y*; 6-10); Celsia Arcturus (*y* and *p*; 4); Cistus psilosepalus (*w*, marked *y*; 2-3); C. rotundifolius (*p*, marked *y*; 1); Cneorum pulverulentum (*y*; 1-3); Coronilla glauca (*y*, *sc* by day; 2-4); Eccremocarpus scaber (*r* or *o-r*); Embothrium coccineum (*o-r*; 3); Ephedra nebrodensis (*w*; 3-4); Escallonia rubra (*r*; 3-6); Fuchsia macrostema globosa (*p-v* and *p-r*; 5-6); F. m. gracilis (*p* and *r*; 6-10); Grindelia glutinosa (*y*; 2); Hydrangea quercifolia (*w*; 4-6); Hypericum empetrifolium (*y*; ½-1); H. Hookerianum (*y*; 2); Illicium anisatum (*y-w*; 4); Leycesteria formosa (*w* and *p*; 4-6); Micromeria Piperella; Olearia dentata (*pi-w*); Rhododendron Maddeni (*w*; 6-8); Tecoma australis (*y-w*, tinged *p* or *r*); T. capensis (*o-r*; 15); Veronica Hulkeana (*l*; 1-3); Yucca Whipplei violacea (*v*; 4-12); Zauschneria californica (*r*; 1).

Tender.—Annuals.—Begonia humilis (*i-h*, *w*; 1); Heliotropium indicum (*st*, *b*; 1); Impatiens Balsamina (*st*, *r*; 1-2); I. flaccida (*c-h*, *p*; ½-1½); Ipomœa Bona-nox (*st*, *w*; 10); I. Quamoclit (*i-h*, *r*; 6); Martynia fragrans (*c-h*, *r-p* and *y*, *sc*; 2); Porana racemosa (*i-h*, *w*); Waitzia aurea (*c-h*).

Biennials.—Convolvulus erubescens (*c-h*, *r-pi*; 12); Humea elegans (*c-h*, *br r*, *pi*, or *r*; 5-6); Phygelius capensis (*c-h*, *r*; 3).

Perennials.—Achimenes Kleei (*i-h*, *l*; ½); A. multiflora (*i-h*, *l*; 1); Æchmea fulgens (*st*, *r* and *b*); Aerides quinquevulnerum (*st*, *w*, *r*, and *p*, *sc*); ½); Agapanthus umbellatus (*c-h*, *b*; 2-3); Aglaonema pictum (*st*, *y*; 1-2); Albuca Nelsoni (*c-h*, *w*, striped *r*; 4-5); Allamanda chelsoni (*st*, *y*); Amomum Cardamomum (*st*, *br*; 8); Amphicome arguta (*c-h*, *r*; 3); A. Emodi (*c-h*, *pi* and *o*; 1-1½); Angelonia salicariæfolia (*st*, *b*; 1½-3); Arthropodium pendulum (*c-h*, *w*; 1½); Astilbe rubra (*c-h*, *pi*; 4-6); Bæa hygrometrica (*c-h*, *b* and *b-y*; ½); Barkeria melanocaulon (*c-h*, *pi-l*, *r-p*, and blotched *g*; 1); Batatas Cavanillesii (*i-h*, *w-r*); Begonia acutiloba (*i-h*, *w*); B. amabilis (*i-h*, *pi* or *w*; ¾); B. amœna (*i-h*, *pi*; ¼); B. boliviensis (*i-h*, *r*; 2); B. Bruantii (*i-h*, *w* or *pi*); B. Chelsoni (*i-h*, *o-r*; 2); B. Clarkii (*i-h*, *r*); B. coriacea (*i-h*, *pi*; ¾); B. Davisii (*i-h*, *r*; ½); B. Dregii (*i-h*, *w*; 1); B. echinosepala (*i-h*, *w*; 1½); B. eximia (*i-h*, *w* and *r*); B. geranifolia (*i-h*, *r* and *w*; 1); B. geranioides (*i-h*, *w*; 1½); B. hydrocotylifolia (*i-h*, *pi*; ½); B. imperialis (*i-h*, *w*; 3); B. malabarica (*i-h*, *pi*; 2); B. maxima (*i-h*, *w*); B. monoptera (*i-h*, *w*; 1-2); B. Pearcei (*i-h*, *y*; 1); B. prismatocarpa (*st*, *o* and *y*; 3); B. Richardsiana (*i-h*, *w*; 1); B. rosæflora (*i-h*, *pi*); B. rubricaulis (*i-h*, *w* and *pi*; 1); B. rubrovenia (*i-h*, *w*; 1-1½); B. strigillosa (*i-h*, *pi*; ¾); B Sutherlandi (*i-h*, *o-r*; 1-2); B. Thwaitesii (*st*, *w*; ½); B. Veitchii (*i-h*, *r*; 1); B. xanthina (*i-h*, *y*; 1); Billbergia amœna (*st*, *g-w*, tipped *b*; 2); Blandfordia aurea (*st*, *o-y*; 1-2); Bletia

August (Tender Perennials)—*continued.*

florida (*st*, *pi*; 2); Boucerosia maroccana (*c-h*, *r-p* and *y*; ½); Brassia Lawrenceana (*i-h*, *y*, spotted *br* and *g*; 1); Broughtonia sanguinea (*st*, *p-r*; 1½); Brunsvigia Cooperi (*c-h*, *y*, edged *r*; 1½); B. Josephinæ (*c-h*, *r*; 1½); Bulbophyllum Lobbi (*i-h*, *y*); Burbidgea nitida (*st*, *o-r*; 2-4); Calanthe Masuca (*i-h*, *v* and *v-p*; 3-4); Calotis cuneifolia (*c-h*, *b*; 1); Canistrum aurantiacum (*st*, *o-y*); Canna Achiras variegata (*st*, *r*); C. indica (*st*, *y* and *r*; 3-6); C. speciosa (*st*; 3); C. Warscewiczii (*st*, *r* and *p*; 3) and vars.; Cattleya citrina (*i-h*, *y*, *sc*; ½-¾); C. crispa (*i-h*, *w*, or *w-l* and *r*; 1); C. eldorado (*i-h*, *pi*, *p-r*, and *o*); C. granulosa (*i-h*, *y-g*, *w*, *br*, &c.); C. Harrisoniæ (*i-h*, *pi*, tinged *y*; 2) and vars.; Ceropegia Sandersoni (*c-h*, *g*, veined); Cineraria cruenta (*c-h*, *r-p*) and vars.; Cirrhopetalum Medusæ (*st*, straw, dotted *pi*); C. Thouarsii (*st*, *o* and *y*, dotted *r*); Cœlogyne asperata (*st*, *c*, *br*, and *y*; 2); C. plantaginea (*i-h*, *g-y*, *w*, and *br*; 1½); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); C. viscosa (*i-h*, *w* and *br*; 1); Convolvulus mauritanicus (*c-h*, *b* and *w*); Crassula Bolusii (*c-h*, *pi-w*; ½-½); Crawfurdia fasciculata (*st*, *p*); Crinum amabile (*st*, *r*, *sc*); C. cruentum (*st*, *r*); C. giganteum (*st*, *w*, *sc*); C. purpurascens (*st*, *p-r*); Curcuma Roscoeana (*st*, *r*, bracts *o*; 1); Cyanella odoratissima (*c-h*, *pi*, *sc*; 1); Cyclamen neapolitanum (*c-h*, *w* or *r*; ½); Cypripedium barbatum (*st*, *p* and *w*; 1) and vars.; C. Hookeræ (*st*, *y*, *br*, and *pi-p*); C. Parishii (*st*, *g-w* and *p*; 2); C. superbiens (*st*, *w* and *br*); Cyrtanthus sanguineus (*c-h*, *o-r* and *y*); Dendrobium chrysotis (*st*, *y* and *p*); D. clavatum (*st*, *y* and *r*); D. crystallinum (*st*, *w*, *o*, *p*, and *pi*); D. formosum (*st*, *w* and *o*); Dichorisandra thyrsiflora (*st*, *b*; 4); Disa megaceras (*c-h*, *w* and *p*; 1-2); Drosera binata (*c-h*, *w*; ½); Eichhornia crassipes (*st*, *v*); Epidendrum bicornutum (*st*, *w* and *r*); E. falcatum (*st*, *g-y* and *y*, *sc*); Fragaria indica (*c-h*, *y*); Galaxia ovata (*c-h*, *y*); Galeandra Baueri lutea (*st*, *y* and *p*; ½); Gesnera discolor (*st*, *r*; 2); G. nagelioides (*st*, *pi*, *r*, and *y*); Gladiolus cardinalis (*c-h*, *r* and *w*; 3-4); G. psittacinus (*c-h*, *r*, *y*, *g*, and *p*; 3); G. purpureo-auratus (*c-h*, *r-y* and *p*; 3-4); Globba Schomburgkii (*st*, *y* and *o-r*; ½-1); Gloriosa superba (*st*, *o* and *r*; 6); Gloxinia glabra (*st*, *w*, *y*, and *p*; ¾); G. maculata (*st*, *p-b*; 1); G. pallidiflora (*st*, *b*; 1); Grammatophyllum multiflorum (*st*, *g*, *br*, and *p*; 2); Griffinia dryades (*i-h*, *p-l* and *w*; 1½); G. hyacinthina (*i-h*, *b* and *w*); G. ornata (*i-h*, *b-l*; 1-1½); Guzmannia tricolor (*st*, *w*, *y-g*, *bk-p*, and *r*); Habenaria rhodochila (*c-h*, *r*, and *g*); Hessea crispa (*c-h*, *pi*; ½); Hibiscus coccineus (*c-h*, *r*; 4-8); H. militaris (*c-h*, *pi*; 2-4); Imantophyllum miniatum (*c-h*, *o*; 1-2); Impatiens Jerdoniæ (*st*, *y* and *r*; ¾); I. Sultani (*st*, *r*; 1); Ipomœa Learii (*st*, *b*); I. rubro-cærulea (*st*, *r*, becoming *p-b*); Kæmpferia ornata (*st*, *y* and *o*); Limnocharis Plumieri (*i-h aq*, *y*; 1½); Lobelia Erinus (*c-h*, *b*, and *w* or *y*; ½); Lotus jacobæus (*c-h*, *p* and *y*; 1-3); Lycaste cristata (*i-h*, *w* and *p*); Lycoris aurea (*c-h*, *y*; 1); L. Sewerzowi (*c-h*, *br-r*, *sc*; 1); Manulea rubra (*c-h*, *y*; 1-2); M. tomentosa (*c-h*, *o*; 1); Marica gracilis (*i-h*, *w* or *b*, and *r-br*; 2); Mimosa pudica (*st*, *r*; 1); Mirabilis Jalapa (*c-h*, variable, *sc*; 2); Nelumbium speciosum (*c-h aq*, *w*, *sc*); Nymphæa Devoniensis (*st aq*, *pi-r*); N. gigantea (*i-h aq*, *b*); N. Lotus (*st aq*, *r* or *w*); N. scutifolia (*i-h aq*, *b*, *sc*); N. stellata (*st aq*, *b*, *sc*); N. s. zanzibarensis (*st aq*, *b*); N. thermalis (*st aq*, *w*); Odontoglossum crispum (*c-h*, *w*, *y*, and *r-br*); O. maxillare (*i-h*, *w*, *o*, and *p-br*); O. Uro-Skinneri (*c-h*, *g* or *g-y*, *w*, *r*, &c.); Oncidium annulare (*i-h*, *br* and *y*); O. barbatum (*st*, *y* and *br*); O. Cebolleta (*st*, *y-r*); O. cornigerum (*i-h*, *y* and *r*); O. cucullatum (*c-h*, *br-p* and *pi-p*); O. divaricatum (*i-h*, *y* and *br*); O. Wentworthianum (*c-h*, *g-y* and *br*); Ottelia ovalifolia (*st aq*, *g* and *y*); Ouvirandra fenestralis (*st aq*, *g-w*); Oxalis lasiandra (*c-h*, *r*; ¾-1½); Passiflora incarnata (*c-h*, *w*, *p*, and *g*, *sc*); Pelargonium Bowkeri (*c-h*, *p* and *y*; 1); P. fissum (*c-h*. *pi*; 1); P. glauciifolium (*c-h*, *bk-p*, edged *g-y*, *sc*); P. oblongatum (*c-h*, *p-c*; ½); Pellionia Daveauana (*st*, *g*; ½); Peristeria elata (*st*, *w*, spotted *l*; 4);

August (Tender Perennials)—*continued.*

Phalænopsis Aphrodite (*st*, *w*, *r*, *o*, and *y*); Pilea microphylla (*st*; ½); Pitcairnia xanthocalyx (*st*, *y*); Ranunculus Lyalli (*c-h*, *w*; 2-4); Renanthera coccinea (*i-h*, *p-r*); Richardia africana (*c-h*, *w*; 2); R. albo-maculata (*c-h*, *g-w*; 2); Rivina humilis (*st*, *w-pi*; 1-2); R. lævis (*st*, *w-pi*; 7-8); Ruellia spectabilis (*i-h*, *p-b*; 2); Salvia cacaliæfolia (*c-h*, *b*; 3); Senecio pyramidalis (*c-h*, *y*; 2); Sinningia concinna (*st*, *p* and *y*); S. conspicua (*st*, *y* and *p*; 1); S. Youngiana (*st*, *v* or *p*; 1-1½); Siphocampylos Humboldtiana (*st*, *r*; 3); Sobralia macrantha (*st*, *p* and *r*; 6-8); Solanum sisymbriifolium (*c-h*, *b* or *w*; 4); Sonchus gummifer (*c-h*, *y*; 2-3); Sonerila Bensoni (*st*, *pi-p*); S. margaritacea (*st*, *pi*) and vars.; Stachys coccinea (*c-h*, *r*; 1-2); Stanhopea Bucephalus (*st*, *y* dotted *p*, *sc*; 2); S. insignis (*st*, *y*, spotted *p*, *sc*); S. oculata (*st*, *y*, spotted *l*); S. tigrina (*st*, *o*, blotched *p-br*, *sc*); Stapelia Asterias (*c-h*, *v*, *y*, and *p*; ½); Stauropsis Batemanni (*st*, *y*, &c.); Stenomesson incarnata (*i-h*, *r*; 2) and vars.; Stokesia cyanea (*c-h*, *b*; 1-1½); Streptocarpus Saundersii (*st*, *b*; 1); Stylidium spathulatum (*c-h*, *y*; ½); Talauma pumila (*st*, *c*, *sc*; 2-4); Teucrium Chamædrys (*c-h*, *pi*); Thunbergia erecta (*st*, *b*, *o*, and *y*; 6) and vars.; Thysanotus junceus (*c-h*, *p*; 1-2); Tillandsia glaucophylla (*st*, *g-w*, *p*, *r*, *g*, and *y*); T. xiphostachys (*st*, *p*, *g*, *y*, and *r*); Torenia flava (*st*, *y* and *p*; ½-¾); T. Fournieri (*st*, *v*, *l*, and *y*; ½-¾); Trichopilia Galeottiana (*c-h*, *g*, *br*, *y*, and *pi-p*); Tritonia miniata (*c-h*, *r*; ¾-1); T. Pottsii (*c-h*, *y* and *r*; 3-4); Tropæolum peregrinum (*c-h*, *y*); Turnera ulmifolia (*st*, *y*; 2-4); Vanda Parishii (*st*, *g-y*, *m*, *w*, &c., *sc*); V. Roxburghii (*st*, *g*, *v-p*, and *w*); V. teres (*st*, *w*, *pi-m*, &c.); Villarsia parnassifolia (*c-h*, *y*; 1-2); Vinca rosea (*i-h*, *pi* or *w*); Wahlenbergia tuberosa (*c-h*, *w* and *pi*; ½-2); Zebrina pendula (*i-h*, *w* and *pi-p*); Zephyranthes citrina (*st*, *y*; ½); Zygopetalum Clayi (*i-h*, *p-br*, *v-p*, and *w*).

SHRUBS.—Acmena floribunda (*c-h*, *w*; 4); Acradenia Frankliniæ (*c-h*, *w*; 8); Æschynanthus cordifolius (*st*, *r*, *bk*, and *o*; 1); Æ. grandiflorus (*st*, *r* and *o*; 5); Æ. longiflorus (*st*, *r*; 2); Æ. speciosus (*st*, *o*; 2); Æ. splendidus (*st*, *r*, spotted *bk*; 1); Alloplectus peltatus (*st*, *w*; 1); Alonsoa incisifolia (*c-h*, *r*; 1-2); Aloysia citriodora (*c-h*, *w* or *l*); Apeiba Tibourbou (*st*, *y*; 10); Aphelandra cristata (*st*, *o-r*; 3); Aristolochia tricaudata (*st*, *p-br*); Babingtonia Camphorasmæ (*c-h*, *pi*; 7); Barleria flava (*st*, *y*; 3); Bauhinia corymbosa (*st*, *pi*); Befaria æstuans (*c-h*, *p*; 10-15); B. ledifolia (*c-h*, *p*; 3-4); Begonia cinnabarina (*st*, *r*; 2); B. coccinea (*st*, *r*; 2); B. Evansiana (*c-h*, *pi*; 2); B. falcifolia (*st*, *r*; 1-2); B. foliosa (*st*, *w*, tinged *pi*); B. Ingramii (*c-h*, *pi*; 2); B. Kunthiana (*st*, *w*); B. maculata (*st*, variable); B. nitida (*st*, *pi*; 4-5); B. platanifolia (*st*, *pi-w*; 5-6); Berzelia lanuginosa (*c-h*, *w*; 1-2); Bignonia Cherere (*i-h*, *o*; 10); B. magnifica (*i-h*, *m* or *p-r*); B. variabilis (*i-h*, *g-y*; 10); Billardiera longiflora (*c-h*, *g-y*, turning *p*); Bonatea speciosa (*st*, *w*; 2); B. Drummondi (*c-h*, *pi*; 2); Bossiæa linophylla (*c-h*, *o* and *p*; 1-4); Bougainvillea glabra (*c-h*, *pi*); Bouvardia leiantha (*c-h*, *r*; 2); Brachylæna nerifolia (*c-h*, *y*; 2); Brownea coccinea (*st*, *r*; 6-10); Bursaria spinosa (*c-h*, *w*; 10); Cassia tomentosa (*st*, *y*; 5-7); Celastrus lucidus (*c-h*, *w*; 1-3); Cereus speciosissimus (*c-h*, *r*; 3-6); Cestrum aurantiacum (*c-h*, *o*; 4); C. elegans (*c-h*, *p-r*); Chætogastra strigosa (*c-h*, *pi-p*; 1); Cloanthes stœchadis (*c-h*, *g-y*; 2); Clavija fulgens (*st*, *o-r*); Clematis caripensis (*st*, *w*, *sc*; 12); Clerodendron fœtidum (*c-h*, *l-pi*; 5); C. fragrans (*c-h*, *w*; 6); C. scandens (*st*, *w*; 10); C. splendens speciossima (*st*, *r*); C. squamatum (*st*, *r*; 10); Cobæa scandens (*c-h*, *p*; 20); Colea floribunda (*st*, *y-w*; 10); Colutea cruenta (*c-h*, *r-y*; 4-6); Convolvulus pannifolius (*c-h*, *v-p* and *w*); Coronilla coronata (*c-h*, *y*; 1-2); Crassula coccinea (*c-h*, *r*; 1-3); C. falcata (*c-h*, *r* or *w*; 3-8); C. versicolor (*c-h*, *r* and *w*); Crotalaria Cunninghamii (*c-h*, *y-g* and *p*; 3); Crowea saligna (*c-h*, *pi*; 1-2); Cytisus canariensis (*c-h*, *y*); Datura arborea (*c-h*, *w*; 7-10); Dipladenia amabilis (*st*, *pi-r*; 10); D. amœna (*st*, *pi*); D. boliviensis (*st*, *w* and *y*); D. Brearleyana (*st*, *pi*, becoming

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r); D. carissima (*st, pi*); D. diadema (*st, pi*); D. hybrida (*st, r*); D. insignis (*st, pi-p*); D. nobilis (*st, pi-p*, becoming *o-r*); D. Regina (*st, pi-w*); D. splendens profusa (*st, r*); Dombeya Burgessiæ (*c-h, w* and *pi*; 10); Doryanthes excelsa (*r*; 8-16); Dracophyllum capitatum (*c-h, w*; 1-1½); Duranta Plumieri (*st, b*; 6-15); Duvalia polita (*c-h, br-p, br*, or *r*, and *o*); Echium fastuosum (*c-h, b*; 2-4); Elæocarpus grandiflora (*st, y, r*, and *w*; 7); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Erica Aitonia (*c-h, r* or *w*; 2); E. Austiniana (*c-h, w* and *r*); E. cerinthoides (*c-h, r*; 3); E. Devoniana (*c-h, p*); E. elegans (*c-h, pi* and *g*; ½-1); E. Fairieana (*c-h, pi* and *w*); E. jasminiflora (*c-h, r*; 1-2); E. Marnockiana (*c-h, p*); E. Massonii (*c-h, r* and *g-y*; 3); E. Parmentieriana (*c-h, r-p*; 1); E. ramentacea (*c-h, p-r*; 1½); E. Savileana (*c-h, r* or *p-r*; 1); E. Shannoniana (*c-h, w* and *p*; 1-2); E. Victoria (*c-h, p* and *w*); E. Westphalingia (*c-h, pi-r*); Eutaxia myrtifolia (*c-h, y*; 2-6); Fuchsia corymbiflora (*c-h, r*; 4-6); F. dependens (*c-h, r*; 2-4); F. fulgens (*c-h, r*; 4-6); F. macrostema (*c-h, r*; 6-12); F. thymifolia (*c-h, r*; 4-6); Gardenia florida (*st, w, sc*; 2-6); Gasteria Croucheri (*c-h, w* and *pi*; 2); Gazania uniflora (*c-h, y*; 1); Geissomeria coccinea (*st, r*; 3); Gomphocarpus fruticosus (*c-h, w*; 5-7); Gompholobium Knightianum (*c-h, pi* or *p*; 1); G. polymorphum (*c-h, r, y*, and *p*); Goodia pubescens (*c-h, y* and *r*; 1-3); Grevillea Banksii (*c-h, r*; 15); Grewia occidentalis (*c-h, p*; 10); Guettarda odorata (*st, r, sc* at night; 6-10); Hakea suaveolens (*c-h, w*; 4); Heliotropium corymbosum (*c-h, l*; 4); Hermannia flammea (*st, o* or *r*; 1-3); Hibbertia dentata (*c-h, y*); H. perfoliata (*c-h, y*); Houttea Gardneri (*st, r*; 2); Hoya carnosa (*i-h, pi-w*); H. Cumingiana (*st, g-y* or *w*, and *p-br*); H. pallida (*st, y* or *y-w*, and *pi, sc*); Hypericum balearicum (*c-h, y*; 1-2); Iochroma fuchsioides (*c-h, o-r*; 5); I. lanceolata (*c-h, p-b*; 4-5); Ixora chelsoni (*st, o-pi*); I. coccinea (*st, r*; 3-4); I. javanica (*st, o*; 3-4); Jasminum grandiflorum (*i-h, w*); J. Sambac (*st, w, sc*); Jatropha podagrica (*st, o-r*; 1½); Lagerströmia indica (*st, pi*; 6-10); Lapageria rosea (*c-h, pi-r*); Leschenaultia biloba (*c-h, b*; 1); L. formosa (*c-h, r*; 1); Leucopogon verticillatus (*c-h, w* or *pi*; 3-6); Lindenia rivalis (*st, w* and *r*; 3); Lippia citriodora (*c-h, w*; 3); Lisianthus pulcher (*i-h, r*; 5); Lonicera sempervirens (*c-h, r* and *y*); Luculia Pinceana (*c-h, w, sc*); Mahernia incisa (*c-h, r*, becoming *y*; 2-4); Mascarenhasia Curnowiana (*st, r*); Melianthus major (*c-h, br*; 4-6); Mesembryanthemum candens (*c-h, w*); M. coccineum (*c-h, r*); M. formosum (*c-h, p*; 1); M. purpureo-album (*c-h, w* and *p*); M. spectabile (*c-h, r*; 1); M. violaceum (*c-h, pi-w* to *v*; 1-2); Mimulus glutinosus (*c-h, br* or *pi*; 5); Myrtus Luma (*c-h, w*; 3); Nerium Oleander (*c-h, r*; 6-14); Nicotiana glauca (*c-h, y*; 10-20); Opuntia arborescens (*c-h, p*; 5); O. echinocarpa (*c-h, g-y*); O. multiflora (*c-h, y*); Oxylobium Callistachys (*c-h, y*; 3-4); O. ellipticum (*c-h, y*; 2-3); Pachypodium succulentum (*st, r* and *w*); Passiflora alata (*st, r, p*, and *w, sc*); P. cæruleo-racemosa (*c-h, p*); P. cincinnata (*c-h, v-p* and *w*); P. coccinea (*st, r* and *o*); P. edulis (*st, p-w, sc*); P. Hahnii (*c-h, w* and *y*); P. racemosa (*st, r*); Pelargonium ardens (*c-h*; 1-1½); P. comptum (*c-h, pi* and *p*); P. fragrans (*c-h, w* and *r*; 2); P. ignescens (*c-h, r*; 1½); P. varieties; Phænocoma prolifera (*c-h, r*; 4); Phylica plumosa squarrosa (*c-h, w*; 2); Phyllanthus Chantrieri (*st, r* and *y*); P. pallidifolius (*st, y* and *r*); Phyllocactus Ackermanni (*st, pi*); Physidium cornigerum (*st, p*; 1); Pitcairnia aphelandræflora (*st, r*); Plumbago capensis (*i-h, b*; 2); Podanthes geminata (*st, o-y* and *r-p*); Portlandia platantha (*st, w*; 3); Protea cynaroides glabrata (*c-h, g-w*); Quisqualis indica (*st*, variable); Rhododendron javanicum (*c-h, o* and *r*; 4); Rondeletia cordata (*st, pi*; 4); R. Purdiei (*st, y, sc*; 4); Ruellia macrophylla (*i-h, r*; 3); Salvia albo-cærulea (*c-h, w* and *b*; 3); S. confertiflora (*c-h, y* and *r*; 3); S. Goudotii (*c-h, r*; 2); S. Grahami (*c-h, p-b*; 2); S. Heerii (*c-h, r*; 2-3); S. rutilans (*c-h, r*; 2-3); Sarmienta repens (*c-h, r*); Satyrium aureum (*i-h, o* and *r*; 1-1½); Scævola Kœnigii (*c-h, r*; 2); Scutellaria Hartwegi (*st, r* and *v*; 1); S. Mociniana (*st, r* and *y*; 1½); Selago

August (Tender Shrubs)—*continued.*

Gillii (*c-h, pi*; ½); Sempervivum aureum (*c-h, y*; 1); Senecio argenteus (*c-h, y*; 1-2); S. macroglossus (*c-h, y*); Solanum atropurpureum (*c-h, p* and *y*); S. Capicastrum (*c-h, w*; 1-2); S. giganteum (*c-h, b*; 10-25); S. jasminoides (*c-h, b-w*) and var.; S. marginatum (*c-h, w* and *p*; 3-4); S. maroniense (*st, b-v*; 6-14); S. Pseudo-capsicum (*c-h, w*; 4); S. pyracanthum (*c-h, b-v*; 3-6); S. Seaforthianum (*st, r* or *l*); Stachytarpheta mutabilis (*st, r*; 3); Statice profusa (*c-h, p* and *w*; 2); Tabernæmontana Barteri (*st, w*; 6); Tacsonia insignis (*i-h, r, v-r* and *w*); T. mollissima (*c-h, pi*); T. Van Volxemii (*i-h, r*); Talinum Arnotii (*c-h, y*); Tecoma jasminioides (*c-h, w*, streaked *r*; 20); Teucrium fruticans (*c-h, b*; 2-3); Thyrsacanthus bracteolatus (*st, r*; 2); T. callistachyus (*st, r*; 2); Vaccinium leucobotrys (*c-h, w*; 4-7); Yucca Treculeana (*c-h, w*; 20-25).

SEPTEMBER. — Hardy. — ANNUALS.— Anagallis grandiflora (*b* and *r*; ¼); Androsace lanuginosa (*pi*; ½-¾); Bellium bellidioides (*w*; ¼); Brachycome iberidifolia (*b* or *w*; 1); Chrysanthemum coronarium (*y*; 4); Collomia coccinea (*r*; 1-1½); C. grandiflora (*r-y*; 1½-2); Convolvulus tricolor (*y, b*, and *w*; 1); Crepis rubra (*r*; ½-1); Fumaria capreolata (*w* and *p*; 4); Impatiens amphorata (*p* and *pi-r*; 3-6); Ionopsidium acaule (*l*, or *w* and *v*; ¼); Ipomœa purpurea (*p*; 10); Limnanthes Douglasii (*y* and *w, sc*; ¾); Linaria spartea (*y*); Lopezia coronata (*pi-p*; 1½); Malcolmia maritima (*l, pi, r*, or *w*; ½-1); Malope trifida (*p* or *w*; 1); Mathiola annua (variable; 1-2); Nicandra physaloides (*b*; 2); Oxalis stricta (*y*; 1½); Papaver Hookeri (*pi*, blotched *w* or *b-bk*; 3-4); Reseda odorata (*y-w, sc*) and vars.; Schizanthus pinnatus (variable; 2); Tropæolum peregrinum (*y*).

BIENNIALS.—Œnothera biennis (*y, sc*; 2-4); Silybum Marianum (*pi-p*; 1-4); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Acanthus spinosissimus (*pi*; 3½); Achillea asplenifolia (*pi*; 1½); A. aurea (*y*; 1½); A. Eupatorium (*y*; 4-5); Acis autumnalis (*w*; ¼-½); Aconitum japonicum (*pi-w*; 6); A. paniculatum (*v*; 2-3); Actinomeris helianthoides (*y*; 3); A. procera (*y*; 8); Alströmeria aurantiaca (*o*; 3-4); A. psittacina (*r*, spotted *p*; 6); Amaryllis Belladonna (variable; 2); Anemone japonica (*pi*; 2-3) and vars.; Anomatheca cruenta (*r*; ½-1); Apios tuberosa (*br-p, sc*; ½); Aquilegia californica (*y* and *o-r*; 2-4); Armeria cephalotes (*pi* or *r*; 1-1½); Arnica Chamissonis (*y*; 1-2); Artemisia cœrulescens (*b*; 2); Asclepias tuberosa (*o*; 1-2); Aster acuminatus (*w*; 2); A. dracunculoides (*w*; 3); A. ericoides (*w*; 3); A. floribundus (*p*; 4); A. hyssopifolius (*w*; 1½-2); A. lævigatus (*pi-w*; 3); A. lævis (*b*; 2); A. multiflorus (*w*; 3); A. novæangliæ (*p*; 6) and vars.; A. paniculatus (*b*; 4); A. pendulus (*w*, turning *pi*; 2); Bellium minutum (*w* and *y*; ¼); Bessera elegans (*r*, or *r* and *w*; 2); Boltonia glastifolia (*p*; 1½); Borago officinalis (*b*; 1-2); Cacalia suaveolens (*w*; 3-5); Calochortus luteus (*g, y*, and *p*; 1); Campanula Allionii (*b* or *w*; ¼); C. garganica (*b*; ¼-½); C. glomerata (*b-v* or *w*; 1-2) and vars.; C. lactiflora (*b-w* or *b*; 2-6); Cassia marylandica (*y*; 2-3); Centaurea aurea (*o-y*; 2); Chelone Lyoni (*p*; 3-4); Cimicifuga americana (*w*; 2-3); Cineraria maritima (*y*; 2); Colchicum autumnale (*p*; ¼) and vars.; C. Bivonæ (*p* and *w*); C. byzantinum (*pi*; ¼); C. Parkinsoni (*w* and *p*); Collinsonia anisata (*y*; 2-3); Coronilla varia (*pi* and *w*, or *w*; 1); Dianthus fragrans (*w* and *p, sc*; ½-¾); Dicentra chrysantha (*y*; 3-5); D. thalictrifolia (*y; sc*); Doronicum plantagineum excelsum (*y*; 5); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Fœniculum vulgare (*y*); Funkia grandiflora (*w, sc*); Gaillardia aristata (*y*; 1½); G. pulchella (*r* and *y*; 2-3); Galega orientalis (*b*; 2-4); Glycyrrhiza glabra (*b*; 3-4); Hablitzia tamnoides (*g*); Helenium autumnale (*y*; 4-6); Helianthus orgyalis (*y*; 6-10); Hypericum perforatum (*y*; 1-3); Inula Hookeri (*y, sc*; 1-2); Kniphofia aloides (*r*, fading to *o* and *g-y*; 3-4); K.

September (Hardy Perennials)—*continued.*

Burchelli (*r*, *y*, and *g*; 1½); Lactuca macrorhiza (*v-p*; ½-3); L. tuberosa (*b*; 1-1½); Lamium maculatum (*p*); Lathyrus magellanicus (*b-p*); Lilium monadelphum (*y* and *p-r*; 3-5); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); L. purpurea (*b-p*; 1-3); L. triornithophora (*p* and *y*); Lobelia syphilitica (*b*; 1-2); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus lepidus (*p-b*; ½); L. leucophyllus (*pi*; 2-3); L. ornatus (*b*; 1-2); L. polyphyllus (*b*; 4); Lychnis diurna (*p-pi*; 1-3); Lysimachia clethroides (*w*; 3); L. Nummularia (*y*); Malva Alcea fastigiata (*r*; 2-3); Merendera Bulbocodium (*pi-l*; ¼); Mimulus moschatus (*y*); Monarda didyma (*r*; 1½); Nymphæa pygmæa (*aq*, *b*, *sc*); Œnothera acaulis (*w*, turning *r*; ½); Œ. glauca (*y*; 1-2); Œ. g. Fraseri (*y*; 1); Œ. pallida (*w* and *y*, turning *r*; 1½); Œ. speciosa (*w*, turning *r*; 2-3); Ourisia coccinea (*r*; ½-1); Oxalis corniculata (*y*); Pentstemon breviflorus (*y* or *pi-w*; 3-6); P. diffusus (*p*; 1½); Phlomis herba-venti (*p-v*; 1-1½); Polygonum affine (*pi-r*; ½); P. amplexicaule (*pi-r* or *w*; 2-3); P. compactum (*w*; 2); P. sphærostachyum (*p-r*); P. vaccinifolium (*pi*); Pratia repens (*v-w*; ¼); Rudbeckia grandiflora (*y*; 3½); Saponaria officinalis (*l* or *w*; 1-3); Scorzonera hispanica (*y*; 3); Sedum erythrostictum (*g*; 1-1½); S. Ewersii (*pi* or *v*); S. maximum (*w-r*; 1-2) and vars.; S. spectabile (*pi*; 1½-2); Sempervivum Moggridgei (*r*; ¾); Senecio pulcher (*p* and *y*; 1-2); Sida Napæa (*w*; 4-10); Silene Schafta (*p*; ½); Solidago lanceolata (*y*; 2-3); Sternbergia lutea (*y*) and var.; Trifolium uniflorum (*b* and *p*; ¼); Viola tricolor (*p*, *w* or *o-y*, &c.; ¼-1½); Xanthocephalum gymnospermoides (*o-y*; 2-4).

SHRUBS.—Abelia rupestris (*pi*, *sc*; 5); A. triflora (*pi-y*; 5); Abutilon striatum (*o-y*; 10); Artemisia Abrotanum (*y*, *sc*; 2-4); Azara integrifolia (*y*; 18); A. microphylla (*g*; 12); Benthamia fragifera (*w*; 10-15); Calluna vulgaris (variable; 1-3); Calycanthus occidentalis (*r*; 6-12); Clematis Flammula (*w*, *sc*; 20); C. florida (*w*; 10); C. tubulosa (*b*; 2-3); C. Vitalba (*w*, *sc*; 8); C. Viticella (*b*, *p*, or *pi*; 20); Clethra acuminata (*w*, *sc*; 10-15); C. alnifolia (*w*; 3-4); C. paniculata (*w*, *sc*; 3-4); C. tomentosa (*w*; 3-4); Cotyledon Sempervivum (*r*; ¼-½); Dabœcia polifolia (*w*, *pi*, or *p*; 1-2); Daphne Cneorum (*pi*, *sc*; 1); Datisca cannabina (*y*; 3-6); Elæagnus macrophylla (*g-y*; 6); Erica ciliaris (*r*; 1); E. vagans (*p-r*; 1); Hydrangea hortensis (variable; 2-3); H. paniculata grandiflora (*w*); Jasminum officinale (*w*, *sc*); Kerria japonica (*o-y*; 3-4); Ligustrum lucidum (*w*; 8-12); Lonicera Periclymenum (*r*); Osmanthus Aquifolium (*w*, *sc*); Passiflora cærulea (*p*, *w*, and *b*, *sc*); Rosa indica (*r*; 4-20); R. varieties (*sc*); Rubus fruticosus (*w* or *pi*); R. laciniatus (*w* or *pi*); Spartium junceum (*y*, *sc*; 6-10); Spiræa Lindleyana (*w*; 4-9); Symphoricarpus racemosus (*pi*; 4-6); Tamarix gallica (*w* or *pi*; 5-10).

Half-hardy.—ANNUALS.—Calandrinia Menziesii (*p-r*; ½); Ipomœa hederacea (*b*; 10); Mentzelia ornata (*w*, *sc*; 2); Nicotiana acutiflora (*w*; 1-2); Schizanthus Grahami (*l*, *y*, and *pi*; 2).

BIENNIALS.—Lobelia vars.; Mathiola incana (*p*; 1-2).

PERENNIALS.—Amaryllis Belladonna (variable; 2); Amicia Zygomeris (*y*, splashed *p*; 8); Amphicome Emodi (*pi* and *o*; 1-1½); Blumenbachia chuquitensis (*r* and *y*); Calceolaria arachnoidea (*p*; 1); C. Burbidgei (*y*; 2-4); Caryopteris Mastacanthus (*v*; 2); Cœlestina ageratoides (*b*; 1); Crocosmia aurea (*o-r*; 2); Erodium Reichardi (*w* and *pi*; ½); Lobelia fulgens (*r*; 1-2); L. splendens (*r*; 1-2); Neja gracilis (*y*; 1); Nierembergia calycina (*y* and *w*); Ophiopogon japonicus intermedius (*l*; 1½); Polianthes tuberosa (*w*, *sc*; 3-4) and vars.; Salvia patens (*b*; 2½); Tropæolum tricolorum (*o-r*, tipped *bk* and *y*); Urginea maritima (*w* and *g-p*).

SHRUBS.—Calceolaria bicolor (*y* and *w*; 2-3); C. scabiosæfolia (*y*); Celsia Arcturus (*y* and *p*; 4); Cistus rotundifolius (*p*, marked *y*; 1); Cneorum pulverulentum (*y*; 1-3); Coronilla glauca (*y*, *sc* by day; 2-4); Escallonia rubra (*r*; 3-6); Fuchsia macrostema gracilis (*p* and *r*; 6-10); Grindelia glutinosa (*y*; 2); Micromeria Piperella; Olearia Gunniana (*w*; 3-5); Pentstemon baccharifolius (*r*; 1½); Photinia japonica (*w*; 10-20); Zauschneria californica (*r*; 1).

Tender.—ANNUALS.—Ipomœa Quamoclit (*i-h*, *r*; 6); Martynia fragrans (*c-h*, *r-p* and *y*, *sc*; 2); Porana racemosa (*i-h*, *w*).

BIENNIALS.—Convolvulus erubescens (*c-h*, *r-pi*; 12); Exacum zeylanicum (*st*, *v*; 1-2); Humea elegans (*c-h*, *br-r*, *pi*, or *r*; 5-6).

PERENNIALS.—Achimenes ocellata (*i-h*, *r-y*; 1½); Æchmea fulgens (*st*); Acrides quinquevulnerum (*st*, *w*, *r*, and *p*, *sc*; ½); Agapanthus umbellatus (*c-h*, *b*; 2-3); Allamanda Schottii (*st*, *y*); Amicia Zygomeris (*c-h*, *y*, splashed *p*; 8); Amphicome Emodi (*c-h*, *pi* and *o*; 1-1½); Astilbe rubra (*c-h*, *pi*; 4-6); Barkeria Lindleyana (*c-h*, *pi-p*, *w*, and blotched *p*; 2); Begonia octopetala (*i-h*, *g-w*; 2); B. picta (*i-h*, *pi*; ½-1); B. semperflorens (*i-h*, *w* or *pi*); Billbergia amœna (*st*, *g-w*, tipped *b*; 2); Bromelia bracteata (*st*, *pi*; 2); Brunsvigia toxicaria (*c-h*, *pi*; 1); Canistrum aurantiacum (*st*, *o-y*); Catasetum maculatum (*st*, *g*, spotted *p*; 3); Cattleya bicolor (*i-h*, *br-g* and *pi-p*; 1½-2); C. Devoniana (*i-h*, *w*, *pi*, and *pi-p*); C. Dowiana (*i-h*, *y*, *p*, and *r-pi*); C. eldorado (*i-h*, *pi*, *p-r*, and *o*); C. granulosa (*i-h*, *y-g*, *w*, *br*, &c.); C. Harrisoniæ (*i-h*, *pi*, tinged *y*; 2) and var.; C. marginata (*i-h*, *pi-r*, *pi*, and *w*, *sc*) and vars.; C. Regnellii (*i-h*, *g*, *b*, *pi-p*, *w*, &c.); Cœlogyne ciliata (*i-h*, *y*, *w*, and *br*); C. speciosa (*i-h*, *w*, *br* or *g*, *y*, and *r*; 1½); Crinum Careyanum (*i-h*); C. Kirkii (*st*, *g* and *r*); C. Moorei (*c-h*, *g* and *r*); Curcuma petiolata (*st*, *y*; 1½); Cyclamen africanum (*c-h*, *w* or *r*, and *p*; ½-½); C. neapolitanum (*c-h*, *w* or *r*; ½); Cycnoches Egertonianum (*st*, *p*; 2); Dendrobium bigibbum (*i-h*, *pi*); D. chrysanthum (*c-h*, *y* and *r*); D. sanguinolentum (*st*, *y*, *pi*, and *p*); D. speciosum (*c-h*, *c* or *y-w*, and *bk*, *sc*); D. superbiens (*st*, *p*); Dichorisandra musaica (*st*, *b*; 1½); D. thyrsiflora (*st*, *b*; 4); Disporum pullum (*c-h*, *br*; 1½); D. p. parviflorum (*c-h*, *br*); Drosera binata (*c-h*, *w*; ½); Fragaria indica (*c-h*, *y*); Galaxia ovata (*c-h*, *y*); Gesnera discolor (*st*, *r*; 2); Gladiolus cruentus (*c-h*, *r* and *w*; 2-3); G. psittacinus (*c-h*, *r*, *y*, *g*, and *p*; 3); G. Saundersii (*c-h*, *r* and *w*; 2-3); Gloxinia maculata (*st*, *p-b*; 1); Gymnostachyum venustum (*st*, *p*; ½); Impatiens Sultani (*st*, *r*; 1); Ipomœa Learii (*st*, *b*); I. Purga (*st*, *p-pi*); Lælia Dominiana (*i-h*, *p*); Limnocharis Plumieri (*i-h aq*, *y*; 1½); Lotus jacobæus (*c-h*, *p* and *y*; 1-3); Lycoris aurea (*c-h*, *y*; 1); Manulea rubra (*c-h*, *y*; 1-2); Masdevallia ionocharis (*c-h*, *w-y* and *p*; ½); M. tovarensis (*c-h*, *w*); M. Veitchiana (*c-h*, *y*, *o-r*, and *p*); Maxillaria grandiflora (*i-h*, *w*, *y*, and *r*); Miltonia candida (*i-h*, *y*, *w*, *br*, and *pi*; ¾); M. Clowesii (*i-h*, *y*, *p*, and *br*); M. Regnelli (*i-h*, *pi-w* and *l-pi*; 1); M. spectabilis (*i-h*, *w* and *pi-v*; ½-¾); Nerine sarniensis (*c-h*, *pi*; 2-2½); Nymphæa Devoniensis (*st aq*, *pi-r*); N. Lotus dentata (*st aq*, *w*); Odontoglossum crispum (*c-h*, *w*, *y*, and *r-br*); O. grande (*c-h*, *o-y*, *c-w*, and *br*); O. Rossii Ehrenbergii (*c-h*, *w* and *br*); O. R. Warnerianum (*c-h*, *w*, *br*, *y*, &c.); O. Uro-Skinneri (*c-h*, *g* or *g-y*, *w*, *r*, &c.); Oncidium cucullatum (*c-h*, *br-p*, and *pi-p*); O. incurvum (*c-h*, *w*, *l*, and *br*, *sc*); O. ornithorhynchum (*c-h*, *pi-p*, *sc*); Pachystoma Thomsonianum (*st*, *w*, *p*, *g*, and *br*; ½); Peristeria elata (*st*, *w*, spotted *l*; 4); Phalænopsis amabilis (*st*, *w* and *y*); P. Aphrodite (*st*, *w*, *r*, *o*, and *y*); Phinea albolineata (*st*, *w*; ¾); Pinguicula caudata (*c-h*, *pi*); Rivina humilis (*st*, *w-pi*; 1-2); R. lævis (*st*, *w-pi*; 7-8); Sinningia concinna (*st*, *p* and *y*); S. speciosa (*st*, *v*) and vars.; Stanhopea insignis (*st*, *y*, spotted *p*; *sc*); S. oculata (*st*, *y*, spotted *l*); S. tigrina (*st*, *o*, blotched *p-br*, *sc*); Stapelia Asterias (*c-h*, *r*, *y*, and *p*; ½); Stauropsis Batemanni (*st*, *y*, &c.); Talauma pumila (*st*, *c*, *sc*; 2-4); Teucrium Chamædrys (*c-h*, *pi*); Thunbergia erecta (*st*, *b*, *o*, and *y*; 6) and var.; Trichopilia Galleotiana (*c-h*, *g*, *br*, *y*, and *pi-p*); Tropæolum peregrinum (*c-h*, *y*); Turnera ulmifolia (*st*, *y*; 2-4); Vanda cærulea (*st*, *b*; 2-3); V. Hookeriana (*st*, *w*, spotted *m*, and *p*); V. Sanderiana (*st*, *y*, *p-r*, and

September (Tender Perennials)—*continued.*

br); Vinca rosea (*i-h, pi* or *w*); Wigandia Vigieri (*i-h, l-b* or *p-r*; 6); Zephyranthes candida (*c-h, g-w*; ½-¾).

Shrubs.—Abutilon megapotamicum (*c-h, r, y,* and *br*; 3); Acmena floribunda (*c-h, w*; 4); Adenocalymna comosum (*st, y*; 10); Alonsoa incisifolia (*c-h, r*; 1-2); Aphelandra cristata (*st, o-r*; 3); Aristolochia ciliosa (*st, y*; 6); Bauhinia natalensis (*st, w*); Begonia nitida (*st, pi*; 4-5); B. prestoniensis (*st, o-r*; 2); Bignonia Cherere (*i-h, o*; 10); Bossiæa linophylla (*c-h, o* and *p*; 1-4); Bouvardia angustifolia (*c-h, r*; 2); B. leiantha (*c-h, r*; 2); B. longiflora (*c-h, w*; 2-3); Brachylæna nerifolia (*c-h, y*; 2); Bredia hirsuta (*c-h, pi*); Bursaria spinosa (*c-h, w*; 10); Cassia tomentosa (*st, y*; 5-7); Celastrus lucidus (*c-h, w*; 1-3); Cereus coccineus (*c-h, r*); Cheirostylis marmorata (*st, w, r,* and *p*; ½); Clavija ornata (*st, o*; 10-12); Clerodendron fragrans (*c-h, w*; 6); Cobæa scandens (*c-h, p*; 20); Coffea arabica (*st, w, sc*; 5-15); Colquhounia coccinea (*c-h, r*); Columnea aureo-nitens (*st, o-r*); Crassula ericoides (*c-h, w*; ½); C. falcata (*c-h, r* or *w*; 3-8); Dipladenia amabilis (*st, pi-r*; 10); Echites nutans (*st, y*); E. stellaris (*st, pi* and *y*; 6); Enkianthus quinqueflorus (*c-h, r* and *pi-w*; 3-10); Erica Aitonia (*c-h, r* or *w*; 2); E. cerinthoides (*c-h, r*; 3); E. gracilis (*c-h, p-r*; 1); E. jasminiflora (*c-h, r*; 1-2); E. Massonii (*c-h, r* and *g-y*; 3); E. melanthera (*c-h, pi*; 2); E. ramentacea (*c-h, p-r*; 1½); E. Savileana (*c-h, r* or *p-r*; 1); E. Shannoniana (*c-h, w* and *p*; 1-2); Eupatorium atrorubens (*c-h, r* and *l*); E. Weinmannianum (*c-h, w, sc*); Fuchsia macrostema (*c-h, r*; 6-12); F. microphylla (*c-h, r*; 2); Goethea multiflora (*st, pi* or *r*); Gomphocarpus fruticosus (*c-h, w*; 5-7); Grewia occidentalis (*c-h, p*; 10); Gustavia gracillima (*st, pi-r*); Heliotropium corymbosum (*c-h, l*; 4); Hoya linearis (*st, w*); Hypericum balearicum (*c-h, y*; 1-2); Jasminum grandiflorum (*i-h, w*); J. Sambac (*st, w, sc*); Lapageria rosea (*c-h, pi-r*); Lippia citriodora (*c-h, w*; 3); Luculia gratissima (*c-h, pi, sc*; 9-16); L. Pinceana (*c-h, w*; *sc*); Mesembryanthemum coccineum (*c-h, r*); M. conspicuum (*c-h, r*; 1); M. minutum (*c-h, y*); M. violaceum (*c-h, pi-w* to *v*; 1-2); Mimulus glutinosus (*c-h, br* or *pi*; 5); Mussænda luteola (*c-h, y* and *o*; 5-6); Nerium Oleander (*c-h, r*; 6-14); Nicotiana glauca (*c-h, y*; 10-20); Opuntia Salmiana (*c-h, y* and *r*; 2); Oxylobium ellipticum (*c-h, y*; 2-3); Pachypodium succulentum (*st, r* and *w*); Passiflora cæruleo-racemosa (*c-h, p*); P. coccinea (*st, r* and *o*); P. quadrangularis (*st, w, r,* and *v, sc*); P. racemosa (*st, r*); P. Raddiana (*st, r*); Pavonia multiflora (*st, r* and *p*); Pelargonium comptum (*c-h, pi* and *p*); P. crispum (*c-h, p*); Phylica plumosa squarrosa (*c-h, w*; 2); Pleroma Benthamianum (*st, p* and *w*; 4); Plumbago capensis (*i-h, b*; 2); Podanthes geminata (*st, o-y* and *r-p*); Protea mellifera (*c-h, pi* or *w*; 6); Psammisia Hookeriana (*i-h, pi-r*; 1½-2); P. Jessicæ (*i-h, r*); Rhipsalis Cassytha (*c-h, g-w*; 1); Rhododendron javanicum (*c-h, o* and *r*; 4); Roezlia granadensis (*st, pi-p*; 3); Ruellia Herbstii (*i-h, pi-p*; 3); Salvia boliviana (*c-h, r*; 4); S. Greggii (*c-h, pi*; 3); Stachytarpheta mutabilis (*st, r*; 3); Stigmaphyllon littorale (*st, y*); Strobilanthes isophyllus (*st, l*; 1-2); Tacsonia insignis (*i-h, r, v-r,* and *w*).

OCTOBER.—Hardy.—Annuals.—Anagallis grandiflora (*b* and *r*; ½); Androsace lanuginosa (*pi*; ½-¾); Brachycome iberidifolia (*b* or *w*; 1); Collomia coccinea (*r*; 1-1½); C. grandiflora (*r-y*; 1½-2); Crepis rubra (*r*; ½-1); Gaillardia amblyodon (*r*; 2-3); Ionopsidium acaule (*l*, or *w* and *v*; ½); Limnanthes Douglasii (*y* and *w, sc*; ¾); Linaria spartea (*y*); Malcolmia maritima (*l, pi, r,* or *w*; ½-1); Mathiola annua (variable; 1-2); Oxalis stricta (*y*; 1½); Papaver Hookeri (*pi*, blotched *w*, or *b-bk*; 3-4); Reseda odorata (*g-r, sc*) and vars.; Schizanthus pinnatus (*v, p,* &c.; 2); Tropæolum peregrinum (*y*).

Biennials.—Œnothera biennis (*y, sc*; 2-4); Stachys germanica (*pi* and *w*; 1-3).

Perennials.—Acanthus spinosissimus (*pi*; 3½); Achillea aurea (*y*; 1½); Acis autumnalis (*w*; ½-1); Alströmeria aurantiaca (*o*; 3-4); Amaryllis Belladonna (variable; 2);

October (Hardy Perennials)—*continued.*

Anemone japonica (*pi*; 2-3) and vars.; Anomatheca cruenta (*r*; ½-1); Apios tuberosa (*br-p, sc*; ½); Armeria cephalotes (*pi* or *r*; 1-1½); Aster concinnus (*p*; 2); A. dracunculoides (*w*; 3); A. dumosus (*w*; 2); A. hyssopifolius (*w*; 1½-2); A. longifolius (*w*; 3) and vars.; A. sikkimensis (*p*; 3); Cacalia suaveolens (*w*; 3-5); Cassia marylandica (*y*; 2-3); Colchicum autumnale (*p*; ½); and vars.; C. Bivonæ (*p* and *w*); C. byzantinum (*pi*; ½); C. Parkinsoni (*w* and *p*); Coronilla varia (*pi* and *w, or w*; 1); Dicentra chrysantha (*y*; 3-5); D. thalictrifolia (*y, sc*); Doronicum plantagineum excelsum (*y*; 5); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Fœniculum vulgare (*y*); Gaillardia aristata (*y*; 1½); G. pulchella (*r* and *y*; 2-3); Galega orientalis (*b*; 2-4); Gentiana Kurroo (*b* and *w*); Glycyrrhiza glabra (*b*; 3-4); Hablitzia tamnoides (*g*); Helenium autumnale (*y*; 4-6); Helianthus orgyalis (*y*; 6-10); Hypericum perforatum (*y*; 1-3); Kniphofia aloides (*r*, fading to *o*, and *g-y*; 3-4); K. Burchelli (*r, y,* and *g*; 1½); Lactuca macrorhiza (*v-p*; ½-3); L. tuberosa (*b*; 1-1½); Lilium monadelphum (*y* and *p-r*; 3-5); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); Lobelia syphilitica (*b*; 1-2); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus leucophyllus (*pi*; 2-3); L. ornatus (*b*; 1-2); L. polyphyllus (*b*; 4); Lychnis diurna (*p-pi*; 1-3); Lysimachia Nummularia (*y*); Malva Alcea fastigiata (*r*; 2-3); Merendera Bulbocodium (*pi-l*; ½); Œnothera glauca (*y*; 1-2); Œ. g. Fraseri (*y*; 1); Oxalis corniculata (*y*); O. lobata (*y* and *r*; ½); Plumbago Larpentæ (*v*; 1); Polygonum affine (*pi-r*; ½); P. amplexicaule (*pi-r* or *w*; 2-3); P. sphærostachyum (*p-r*); P. vaccinifolium (*pi*); Pratia repens (*v-w*; ½); Saxifraga cortusæfolia (*w*); Sedum kamtschaticum (*y*); Senecio pulcher (*p* and *y*; 1-2); Silene Schafta (*p*; ½); Solidago speciosa (*y*; 3-6); Sternbergia lutea (*y*) and vars.

Shrubs.—Abutilon striatum (*o-y*; 10); Artemisia Abrotanum (*y, sc*; 2-4); Azara integrifolia (*y*; 18); A. microphylla (*g*; 12); Benthamia fragifera (*w*; 10-15); Calycanthus occidentalis (*r*; 6-12); Clematis Flammula (*w, sc*; 20); C. tubulosa (*b*; 2-3); Clethra acuminata (*w, sc*; 10-15); C. paniculata (*w, sc*; 3-4); C. tomentosa (*w*; 3-4); Elæagnus macrophylla (*g-y*; 6); Hamamelis virginica (*y*); Hydrangea paniculata grandiflora (*w*); Kerria japonica (*o-y*; 3-4); Ligustrum lucidum (*w*; 8-12); Lonicera Periclymenum (*r*); Osmanthus Aquifolium (*w, sc*); Passiflora cærulea (*p, w,* and *b, sc*); Rosa indica (*r*; 4-20).

Half-hardy.—Annual.—Schizanthus Grahami (*l* or *pi*, and *y*; 2).

Biennials.—Lobelia vars.; Mathiola incana (*p*; 1-2).

Perennials.—Amaryllis Belladonna (variable; 2); Amicia Zygomeris (*y*, splashed *p*; 8); Amphicome Emodi (*pi* and *o*; 1-1½); Boussingaultia baselloides (*w*, turning *bk*, *sc*); Calceolaria Burbidgei (*y*; 2-4); Caryopteris Mastacanthus (*v*; 2); Cœlestina ageratoides (*b*; 1); Crocosmia aurea (*o-r*; 2); Neja gracilis (*y*; 1); Ophiopogon japonicus intermedius (*l*; 1½); Polianthes tuberosa (*w, sc*; 3-4) and vars.; Schizostylis coccinea (*r*; 3); Tropæolum tricolorum (*o-r*, tipped *bk*, and *y*); Urginea maritima (*w* and *g-p*).

Shrubs.—Calceolaria bicolor (*y* and *w*; 2-3); C. scabiosæfolia (*y*); Camellia japonica (variable; 20); Fuchsia macrostema gracilis (*p* and *r*; 6-10); Grindelia glutinosa (*y*; 2); Micromeria Piperella; Photinia japonica (*w*; 10-20); Zauschneria californica (*r*; 1).

Tender.—Annuals.—Martynia fragrans (*c-h, r-p* and *y, sc*; 2); Porana racemosa (*i-h, w*).

Biennial.—Humea elegans (*c-h, br-r, pi,* or *r*; 5-6).

Perennials.—Achimenes ocellata (*i-h, r-y*; 1½); Æchmea cœrulescens (*st, b*; 1); Agapanthus umbellatus (*c-h, b*; 2-3); Amicia Zygomeris (*c-h, y*, splashed *p*; 8); Amphicome Emodi (*c-h, pi* and *o*; 1-1½); Angræcum bilobum (*st, w* and *p*; ½); Anthurium Lindenianum (*st, w*; 3); Astilbe rubra (*c-h, pi*; 4-6); Begonia octopetala (*i-h, g-w*; 2); B. picta (*i-h, pi*; ½-1); B. pruinata (*i-h, w*); B. semper-

October (Tender Perennials)—*continued.*

florens (*i-h, w* or *pi*); Bifrenaria aurantiaca (*st, o*; ¾); Billbergia amœna (*st, g-w*, tipped *b*; 2); Brunsvigia toxicaria (*c-h, pi*; 1); Cattleya Dowiana (*i-h, y, p*, and *v-pi*); C. guttata (*i-h, g, w, p, y*, &c.; 1½-2) and vars.; C. Harrisoniæ (*i-h, pi*, tinged *y*; 2) and var.; C. labiata (*i-h, pi* and *r*; 1½-2) and vars.; C. marginata (*i-h, pi-r, pi*, and *w, sc*) and vars.; Cœlogyne ciliata (*i-h, y, w*, and *br*); C. maculata (*i-h, w* and *r*); C. speciosa (*i-h, w, br* or *g, y*, and *r*; 1½); C. Wallichiana (*i-h, p* and *w, sc*; 1); Crinum Balfourii (*st, w, sc*); C. Careyanum (*i-h*); C. Moorei (*c-h, g* and *r*); Cyclamen africanum (*c-h, w* or *r*, and *p*; ½-½); C. cilicicum (*c-h, w* and *p*; ¼); Cycnoches Egertonianum (*st, p*; 2); Dahlia imperialis (*c-h, w, l*, and *r*; 10-12); Dendrobium bigibbum (*i-h, pi*); D. sanguinolentum (*st, y, pi*, and *p*); D. speciosum (*c-h, c* or *y-w*, and *bk, sc*); D. superbiens (*st, p*); Dichorisandra musaica (*st, b*; 1½); D. thyrsiflora (*st, b*; 4); Fragaria indica (*c-h, y*); Gladiolus psittacinus (*c-h, r, y, g*, and *p*; 3); G. Saundersii (*c-h, r* and *w*; 2-3); Gloxinia maculata (*st, p-b*; 1); Hymenocallis amœna (*st, w, sc*; 1-2); Impatiens Sultani (*st, r*; 1); Ipomœa Learii (*st, b*); I. Purga (*st, p-pi*); Lælia Dominiana (*i-h, p*); L. Perrinii (*i-h, pi-p* and *r*); Limnocharis Plumieri (*i-h aq, y*; 1½); Lotus jacobæus (*c-h, p* and *y*; 1-3); Masdevallia tovarensis (*c-h, w*); M. Veitchiana (*c-h, y, o-r*, and *p*); Maxillaria grandiflora (*i-h, w, y*, and *r*); Miltonia candida (*i-h, y, w, br*, and *pi*; ¾); M. Clowesii (*i-h, y, p*, and *br*); M. Regnelli (*i-h, pi-w* and *l-pi*; 1); M. spectabilis (*i-h, w* and *pi-v*; ½-¾); Mormodes atropurpureum (*st, p-br*; 1); M. Ocanæ (*st, o-y* and *r-br*); Nerine sarniensis (*c-h, pi*; 2-2½); Nymphæa Devoniensis (*st aq, pi-r*); N. Lotus dentata (*st aq, w*); Odontoglossum crispum (*c-h, w, y*, and *r-br*); O. grande (*c-h, o-y, c-w*, and *br*); O. Rossii Ehrenbergii (*c-h, w* and *br*); O. R. Warnerianum (*c-h, w, br, y*, &c.); O. Uro-Skinneri (*c-h, g* or *g-y, w, r*, &c.); Oncidium cucullatum (*c-h, br-p* and *pi-p*); O. incurvum (*c-h, w, l*, and *br, sc*); O. ornithorhynchum (*c-h, pi-p, sc*); Oxalis variabilis (*c-h, w* or *r*; ¼); Pachystoma Thomsonianum (*st, w, p, g*, and *br*; ½); Phalænopsis amabilis (*st, w* and *y*); P. Aphrodite (*st, w, r, o*, and *y*); Pinguicula caudata (*c-h, pi*); Rivina humilis (*st, w-pi*; 1-2); Scutellaria splendens (*st, r*; 1); Sinningia concinna (*st, p* and *y*); Stanhopea oculata (*st, y*, spotted *l*); Stapelia Asterias (*c-h, v, y*, and *p*; ½); Tachiadenus carinatus (*st, w* and *v*); Talauma pumila (*st, c, sc*; 2-4); Thunbergia erecta (*st, b, o*, and *y*; 6) and var.; Trichocentrum orthoplectron (*st, b, y, w*, and *r*); Tropæolum azureum (*c-h, b* and *g-w*); T. peregrinum (*c-h, y*); Vanda cærulea (*st, b*; 2-3); V. Sanderiana (*st, y, p-r*, and *br*); Vinca rosea (*i-h, pi* or *w*); Wigandia Vigieri (*i-h, l-b* or *p-r*; 6).

SHRUBS.—Abutilon megapotamicum (*c-h, r, y*, and *br*; 3); Adhatoda cydoniæfolia (*st, w* and *p*); Æschynanthus fulgens (*st, r* and *o*; 1); Aganosma caryophyllata (*st, y*); A. Roxburghii (*st, w*); Alonsoa incisifolia (*c-h, r*; 1-2); Aphelandra acutifolia (*st, r*); A. cristata (*st, o-r*; 3); Ardisia villosa mollis (*st, w*); Aristolochia ornithocephala (*st, p*; 20); Begonia nitida (*st, pi*; 4-5); B. prestoniensis (*st, o-r*; 2); Bignonia Cherere (*i-h, o*; 10); Bocconia frutescens (*c-h, g*; 3-6); B. leiantha (*c-h, r*; 2); Brachylæna nerifolia (*c-h, y*; 2); Bredia hirsuta (*c-h, pi*); Bursaria spinosa (*c-h, w*; 10); Clerodendron fragrans flore-pleno (*c-h, w*, tinged *pi, sc*; 6); Cobæa scandens (*c-h, p*; 20); Cotyledon coccinea (*c-h, r* and *y*; 1-2); C. grandiflora (*c-h, r-o*; 1-2); C. racemosa (*c-h, r*; 2); Crossandra guineensis (*st, l*; ¼-½); Erica cerinthoides (*c-h, r*; 3); E. gracilis (*c-h, p-r*; 1); E. jasminiflora (*c-h, r*; 1-2); E. Massonii (*c-h, r* and *g-y*; 3); E. melanthera (*c-h, pi*; 2); E. ramentacea (*c-h, p-r*; 1½); Eupatorium atrorubens (*c-h, r* and *l*); E. Weinmannianum (*c-h, w, sc*); Fuchsia macrostema (*c-h, r*; 6-12); F. microphylla (*c-h, r*; 2); F. simplicicaulis (*c-h, pi-r*); Gardenia nitida (*st, w*; 3); Hoya australis (*i-h, w* and *pi, sc*); H. linearis (*st, w*); Jasminum grandiflorum (*i-h, w*); J. Sambac (*st, w, sc*); Lapageria rosea (*c-h, pi-r*); Lippia citriodora (*c-h, w*; 3); Luculia gratissima (*c-h, pi,*

October (Tender Shrubs)—*continued.*

sc; 9-16); Mesembryanthemum conspicuum (*c-h, r*; 1); M. floribundum (*c-h, r* and *w*; ½); M. minutum (*c-h, y*); M. violaceum (*c-h, pi-w* to *v*; 1-2); Mimulus glutinosus (*c-h, br* or *pi*; 5); Monochætum Humboldtianum (*c-h, r-p*); Mussænda luteola (*c-h, y*, and *o*; 5-6); Nerium Oleander (*c-h, r*; 6-14); Nicotiana glauca (*c-h, y*; 10-20); Pachypodium succulentum (*st, r* and *w*); Passiflora cæruleoracemosa (*c-h, p*); P. coccinea (*st, r* and *o*); P. racemosa (*st, r*); P. Raddiana (*st, r*); Pelargonium comptum (*c-h, pi* and *p*); Pentas carnea (*st, pi-w*; 1½); Pereskia aculeata (*st, w*; 5-7); P. Bleo (*st, r*; 8-10); Phylica plumosa squarrosa (*c-h, w*; 2); Phyllocactus anguliger (*st, w* and *y*); Pleroma Benthamianum (*st, p* and *w*; 4); P. Gayanum (*st, w*; 1-2); Plumbago capensis (*i-h, b*; 2); Podanthes geminata (*st, o-y* and *r-p*); Reinwardtia trigynum (*i-h, y*; 2-3); Rhododendron javanicum (*c-h, o* and *r*; 4); Roezlia granadensis (*st, pi-p*; 3); Salvia boliviana (*c-h, r*; 4); S. Greggii (*c-h, pi*; 3); Satyrium coriifolium (*i-h, y*; 1); Stachytarpheta mutabilis (*st, r*; 3); Stigmaphyllon ciliatum (*st, y*); S. littorale (*st, y*); Strobilanthes isophyllus (*st, l*; 1-2); S. Wallichii (*st, b*; ½-2); Tacsonia insignis (*i-h, r, v-r*, and *w*); Vaccinium erythrinum (*c-h, r*; 1½); Whitfieldia lateritia (*st, r* and *o*; 3).

NOVEMBER. — Hardy. — ANNUALS. — Anagallis grandiflora (*b* and *r*; ¼); Brachycome iberidifolia (*b* or *w*; 1); Crepis rubra (*r*; ½-1); Ionopsidium acaule (*l*, or *w* and *v*; ½); Linaria spartea (*y*); Malcolmia maritima (*l, pi, r*, or *w*; ½-1); Oxalis stricta (*y*; 1½); Papaver Hookeri (*pi*, blotched *w* or *b-bk*; 3-4).

BIENNIALS.—Œnothera biennis (*y, sc*; 2-4); Stachys germanica (*pi* and *w*; 1-3).

PERENNIALS.—Acanthus spinosissimus (*pi*; 3½); Achillea aurea (*y*; 1½); Acis autumnalis (*w*; 1½); Alströmeria aurantiaca (*o*; 3-4); A. chilensis (*r* or *pi*; 2-3) and vars.; Anemone japonica (*pi*; 2-3) and vars.; Anomatheca cruenta (*r*; ½-1); Armeria cephalotes (*pi* or *r*; 1-1½); Aster grandiflorus (*p*; 2); Cacalia suaveolens (*w*; 3-5); Colchicum autumnale (*p*; ¼) and vars.; C. Bivonæ (*p* and *w*); C. byzantinum (*pi*; ¼); C. Parkinsoni (*w* and *p*); Coronilla varia (*pi* and *w*, or *w*; 1); Dicentra chrysantha (*y*; 3-5); D. thalictrifolia (*y; sc*); Erigeron glaucus (*p*; ½-1); E. speciosus (*v* and *y*; 1½); Gaillardia aristata (*y*; 1½); G. pulchella (*r* and *y*; 2-3); Galega orientalis (*b*; 2-4); Glycyrrhiza glabra (*b*; 3-4); Helenium autumnale (*y*; 4-6); Helianthus orgyalis (*y*; 6-10); Hypericum perforatum (*y*; 1-3); Kniphofia aloides (*r*, fading to *o* and *g-y*; 3-4); K. Burchelli (*r, y*, and *g*; 1½); K. Rooperi (*o-r*, becoming *y*; 2); Lactuca macrorhiza (*v-p*; ½-3); L. tuberosa (*b*; 1-1½); Linaria alpina (*b-v* and *y*; ½); L. Cymbalaria (*b* or *l*); Lobelia syphilitica (*b*; 1-2); Lotus corniculatus (*y*, fading to *o*, and *r*); Lupinus leucophyllus (*pi*; 2-3); L. ornatus (*b*; 1-2); L. polyphyllus (*b*; 4); Lychnis diurna (*p-pi*; 1-3); Merendera Bulbocodium (*pi-l*; ¼); Oxalis corniculata (*y*); O. lobata (*y* and *r*; ¼); Polygonum affine (*pi-r*; ½); P. sphærostachyum (*p-r*); P. vaccinifolium (*pi*); Sedum kamtschaticum (*y*); Senecio pulcher (*p* and *y*; 1-2); Sternbergia lutea (*y*) and var.

SHRUBS.—Abutilon striatum (*o-y*; 10); Azara integrifolia (*y*; 18); A. microphylla (*g*; 12); Clematis tubulosa (*b*; 2-3); Elæagnus macrophylla (*g-y*; 6); Hamamelis virginica (*y*); Hydrangea paniculata grandiflora (*w*); Kerria japonica (*o-y*; 3-4); Ligustrum lucidum (*w*; 8-12); Osmanthus Aquifolium (*w, sc*); Rosa indica (*r*; 4-20).

Half-hardy. — PERENNIALS. — Amaryllis Belladonna (variable; 2); Amicia Zygomeris (*y*, splashed *p*; 8); Boussingaultia baselloides (*w*, turning *bk, sc*); Calceolaria Burbidgei (*y*; 2-4); Caryopteris Mastacanthus (*v*; 2); Crocosmia aurea (*o-r*; 2); Ophiopogon japonicus intermedius (*l*; 1½); Polianthes tuberosa (*w, sc*; 3-4) and vars.; Schizostylis coccinea (*r*; 3).

SHRUBS.—Calceolaria bicolor (*y* and *w*; 2-3); Camellia

November (Half-hardy Shrubs)—*continued.*

japonica (variable; 20); C. oleifera (*w, sc*; 6-8); Fuchsia macrostema gracilis (*p* and *r*; 6-10); Grindelia glutinosa (*y*; 2); Photinia japonica (*w*; 10-20); Plagianthus Lampenii (*y*; 6-8); Zauschneria californica (*r*; 1).

Tender.—ANNUALS.—Martynia fragrans (*c-h, r-p* and *y, sc*; 2); Porana racemosa (*i-h, w*).

PERENNIALS.—Achimenes ocellata (*i-h, r-y*; 1½); Ægiphila grandiflora (*st, y*; 3); Agapanthus umbellatus (*c-h, b*; 2-3); Amicia Zygomeris (*c-h, y*, splashed *p*; 8); Angræcum bilobum (*st, w* and *pi, sc*; ½); A. caudatum (*st, g-y, br, w*, and *g*; 1½); A. sesquipedale (*st, w*; 1); Astilbe rubra (*c-h, pi*; 4-6); Begonia octopetala (*i-h, g-w*; 2); B. picta (*i-h, pi*; ½-1); B. pruinata (*i-h, w*); B. semperflorens (*i-h, w* or *pi*); Billbergia amœna (*st, g-w*, tipped *b*; 2); Canna discolor (*st, r*; 6); Cattleya Dowiana (*i-h, y, p*, and *v-pi*); C. guttata (*i-h, g, w, p, y*, &c.; 1½-2) and vars.; C. labiata (*i-h, pi* and *r*; 1½-2) and vars.; Centropogon fastuosus (*c-h, pi*; 2); C. Lucyanus (*st, pi*); Cœlogyne ciliata (*i-h, y, w*, and *br*); C. humilis (*i-h, w, pi, r*, and *br*); C. maculata (*i-h, w* and *r*); C. speciosa (*i-h, w, br* or *g, y*, and *r*; 1½); Comparettia coccinea (*i-h, r*; ½); Crinum Careyanum (*i-h*); C. Macowani (*c-h, w*, tinged *p*); C. Moorei (*c-h, g* and *r*); Cycnoches Egertonianum (*st, p*; 2); Dahlia imperialis (*c-h, w, l*, and *r*; 10-12); Dendrobium sanguinolentum (*st, y, pi*, and *p*); D. speciosum (*c-h, c* or *y-w*, and *bk, sc*); D. superbiens (*st, p*); Dichorisandra musaica (*st, b*; 1½); D. thyrsiflora (*st, b*; 4); Didymocarpus primulæfolia (*st, l*; ¼-½); Dorstenia Mannii (*st, g*; 1); Episcia chontalensis (*st, l, y*, and *w*; ½-1); Gladiolus psittacinus (*c-h, r, y, g*, and *p*; 3); G. Saundersii (*c-h, r* and *w*; 2-3); Impatiens Sultani (*st, r*; 1); Ipomœa Purga (*st, p-pi*); Lælia Dominiana (*i-h, p*); L. Perrinii (*i-h, pi-p* and *r*); Limnocharis Plumieri (*i-h aq, y*; 1½); Lotus jacobæus (*c-h, p* and *y*; 1-3); Lycaste Skinneri (*i-h, w, pi-l*, and *r*); Masdevallia tovarensis (*c-h, w*); M. Veitchiana (*c-h, y, o-r*, and *p*); Maxillaria grandiflora (*i-h, w, y*, and *r*); M. luteo-grandiflora (*i-h, c-w, br-r*, and *o*); Miltonia candida (*i-h, y, w, br*, and *pi*; ¾); M. Clowesii (*i-h, y, p*, and *br*); M. Regnelli (*i-h, pi-w* and *l-pi*; 1); M. spectabilis (*i-h, w* and *pi-v*; ½-¾); Nerine sarniensis (*c-h, pi*; 2-2½); Nymphæa Devoniensis (*st aq, pi-r*); N. Lotus dentata (*st aq, w*); Odontoglossum crispum (*c-h, w, y*, and *r-br*); O. grande (*c-h, o-y, c-w*, and *br*); O. Rossii Ehrenbergii (*c-h, w* and *br*); O. R. Warnerianum (*c-h, w, br, y*, &c.); O. Uro-Skinneri (*c-h, g* or *g-y, w, r*, &c.); Oncidium cucullatum (*c-h, br-p* and *pi-p*); O. Forbesii (*i-h, r-br, y*, and *w*); O. incurvum (*c-h, w, l*, and *br, sc*); O. ornithorhynchum (*c-h, pi-p, sc*); Oxalis variabilis (*c-h, w* or *r*; ¼); Pachystoma Thomsonianum (*st, w, p, g*, and *br*; ½); Phalænopsis amabilis (*st, w* and *y*); P. Aphrodite (*st, w, r, o*, and *y*); Pinguicula caudata (*c-h, pi*); Saccolabium bigibbum (*st, y* and *w*); Sinningia concinna (*st, p* and *y*); Sophronitis militaris (*c-h, r* and *y*; ½); Stanhopea oculata (*st, y*, spotted *l*); Stapelia Asterias (*c-h, v, y*, and *p*; ½); Talauma pumila (*st, c, sc*; 2-4); Thunbergia erecta (*st, b, o*, and *y*; 6) and var.; Tillandsia carinata (*st, y* and *r*, tipped *g*); Vanda cærulea (*st, b*; 2-3); Wigandia Vigieri (*i-h, l-b* or *p-r*; 6).

SHRUBS.—Abutilon megapotamicum (*c-h, r, y*, and *br*; 3); A. varieties; Ægiphila grandiflora (*st, y*; 3); Aphelandra cristata (*st, o-r*; 3); Argyreia splendens (*st, r*; 10); Begonia nitida (*st, pi*; 4-5); B. prestoniensis (*st, o-r*; 2); Bœbera incana (*c-h, y*; 1½); B. leiantha (*c-h, r*; 2); Brachylæna nerifolia (*c-h, y*; 2); Brachyotum confertum (*c-h, p* and *c*); Bredia hirsuta (*c-h, pi*); Bursaria spinosa (*c-h, w*; 10); Chænostoma linifolia (*c-h, w* or *y*; 1); Columnea erythrophæa (*st, r*, 2); Daphne odora Mazeli (*c-h, w* and *pi, sc*); Erica cerinthoides (*c-h, r*; 3); E. gracilis (*c-h, p-r*; 1); E. jasminiflora (*c-h, r*; 1-2); E. melanthera (*c-h, pi*; 2); E. ramentacea (*c-h, p-r*; 1½); Eupatorium atrorubens (*c-h, r* and *l*); E. Weinmannianum (*c-h, w, sc*); Fuchsia microphylla (*c-h, r*; 2); Gardenia nitida (*st, w*; 3); Hoya linearis (*st, w*); Jasminum Sambac (*st, w, sc*); Lapageria rosea (*c-h, pi-r*); Lippia citriodora

November (Tender Shrubs)—*continued.*

(*c-h, w*; 3); Luculia gratissima (*c-h, pi, sc*; 9-16); Mesembryanthemum conspicuum (*c-h, r*; 1); M. minutum (*c-h, y*); Mimulus glutinosus (*c-h, br* or *pi*; 5); Monochætum Humboldtianum (*c-h, r-p*); Mussænda luteola (*c-h, y* and *o*; 5-6); Pachypodium succulentum (*st, r* and *w*); Passiflora Actinia (*w*); P. coccinea (*st, r* and *o*); P. Raddiana (*st, r*); Pelargonium comptum (*c-h, pi* and *p*); Pentas carnea (*st, pi-w*; 1½); Pereskia Bleo (*st, r*; 8-10); Phlogacanthus curviflorus (*st, y*; 3-6); Phylica plumosa squarrosa (*c-h, w*; 2); Pleroma Benthamiana (*st, p* and *w*; 4); P. Gayanum (*st, w*; 1-2); Plumbago capensis (*i-h, b*; 2); Podanthes geminata (*st, o-y* and *r-p*); Proclesia acuminata (*st, r* and *g*); Rhododendron javanicum (*c-h, o* and *r*; 4); Roezlia granadensis (*st, pi-p*; 3); Rondeletia odorata (*st, r, sc*; 4); Salvia boliviana (*c-h, r*; 4); S. Greggii (*c-h, pi*; 3); Stachytarpheta mutabilis (*st, r*; 3); Stigmaphyllon littorale (*st, y*); Strobilanthes glomeratus (*st, p*; 2-6); S. isophyllus (*st, l*; 1-2); Tacsonia insignis (*i-h, r, v-r*, and *w*); Whitfieldia lateritia (*st, r* and *o*; 3).

DECEMBER.— Hardy.—ANNUAL.—Oxalis stricta (*y*; 1½).

PERENNIAL.—Helleborus niger (*w*; ½-1½).

SHRUBS.—Arctostaphylos tomentosa (*w*; 4); Chimonanthus fragrans (*w* or *y*, and *p, sc*); Hamamelis arborea (*y* and *p*; 15-20); H. virginica (*y*); Jasminum nudiflorum (*y*); Kerria japonica (*o-y*; 3-4); Viburnum Tinus (*w* or *pi*; 8-10).

Half-hardy.—PERENNIALS.—Calceolaria Burbidgei (*y*; 2-4); Caliphruria subedentata (*w*; 1½).

SHRUBS.—Dianthera ciliata (*st, v* and *w*; 2); Grindelia glutinosa (*y*; 2); Plagianthus Lampenii (*y*; 6-8).

Tender.—ANNUALS.—Acroclinium roseum (*c-h, pi*; 1-2) and vars.

BIENNIAL.—Exacum macranthum (*st, b-p*; 1½).

PERENNIALS.—Æchmea cœlestis (*st, b*); Angræcum bilobum (*st, w* and *pi*; ½); A. sesquipedale (*st, w*; 1); Arpophyllum spicatum (*c-h, r*); Barkeria elegans (*c-h, pi* and *r*, spotted; 2); Begonia Berkeleyi (*i-h, pi*); B. Fœbeli (*i-h, r*); B. manicata (*st, pi*; 2); B. megaphylla (*i-h, w*); B. natalensis (*c-h, pi*; 1½); B. nelumbiifolia (*i-h, w* or *pi*; 1-2); B. pruinata (*i-h, w*); B. ricinifolia (*i-h*); B. Schmidtiana (*i-h, w*; 1); B. semperflorens (*i-h, w* or *pi*); B. socotrana (*st, pi*); B. Verschaffeltiana (*i-h, pi*); Billbergia Liboniana (*st, r, w*, and *p*; 1); Bletia Shepherdii (*st, p* and *y*; 2); Brassavola Digbyana (*i-h, c-w*, streaked *p*; ¾); Burlingtonia decora (*st, w* or *pi*, spotted *r*); Calanthe Veitchii (*st, p* and *w*; 3); Canna gigantea (*st, o-r* and *p-r*; 6); C. limbata (*st, y-r*; 3); Cattleya maxima (*i-h, pi, w, p-r*, &c.; 1-1½); C. Trianæ (*i-h, pi-w, o*, or *y*, and *p*) and vars.; C. Warscewiczii (*i-h, p-w* and *r*; 1); Centropogon Lucyanus (*st, pi*); Cobæa penduliflora (*i-h, g*); Cœlogyne barbata (*st, w* and *br*; ½); C. cristata (*i-h, w* and *y, sc*; ¾); C. flaccida (*i-h, w, y*, and *r, sc*; 1); C. Gardneriana (*st, w* and *g-y*); C. Gowerii (*i-h, w* and *g-y*); C. media (*i-h, c-w, y*, and *br*; 1); C. odoratissima (*i-h, w* and *y, sc*); C. speciosa (*i-h, w, br* or *g, y*, and *r*; 1½); Cyanotis Kewensis (*st, pi*); Cymbidium giganteum (*st, br, y*, and *p*); C. Mastersii (*i-h, w* and *pi, sc*); Cypripedium Haynaldianum (*st, g, pi, w*, and *br*); C. insigne (*i-h, y-g, w, y*, and *r-br*) and vars.; C. venustum (*c-h, g-w* or *pi*, and *y-g*); Cyrtochilum maculatum (*st, g* and *p*); Dendrobium Linawianum (*c-h, pi-l* and *r*); D. Pierardii (*c-h, c-w* or *pi, y*, and *p*); D. secundum (*st, p* and *y*); Episcia chontalensis (*st, l, y*, and *w*; ½-1); Gentiana Fortunei (*c-h, b*, spotted *w*); Gesnera exoniensis (*st, o-r*); G. pyramidalis (*st, o-r* and *r*); Goodyera discolor (*c-h, w* and *g-y*); Grammatophyllum speciosum (*st, o-y, p*, and *r*; 10); Gymnostachyum ceylanicum (*st, w, g*, and *y*); Imantophyllum cyrtanthiflorum (*c-h, pi* or *y*); I. Gardeni (*c-h, r-o* or *y*); Impatiens Hookeriana (*st, w* and *r*; 2½); I. Sultani (*st, r*; 1); I. Walkeri (*st, r*; 1-1½); Ipomœa Horsfalliæ (*st, pi*); Isoloma hondense (*st, y*); Lælia albida (*i-h, w, pi*, and *y, sc*);

December (Tender Perennials)—*continued.*

L. anceps (*c-h, pi-l, p,* and *l, sc*); L. autumnalis (*i-h, pi, pi-w,* and *y, sc*); L. superbiens (*i-h, pi, r,* and *y*); Lycaste aromatica (*i-h, y*); L. Deppei (*i-h, y, br, w,* and *r*); L. Skinneri (*i-h, w, pi-l,* and *r*); Masdevallia coccinea (*c-h, y,* and *r*); M. Lindeni (*c-h, w, pi,* and *m*); M. tovarensis (*c-h, w*); M. Veitchiana (*c-h, y, o-r,* and *p*); M. Wallisii (*c-h, y, r,* and *r-p*); Maxillaria luteo-grandiflora (*i-h, c-w, br-r,* and *o*); M. venusta (*i-h, w, y,* and *r*); Nymphæa Devoniensis (*st aq, pi-r*); Odontoglossum crispum (*c-h, w, y,* and *r-br*); O. grande (*c-h, o-y, c-w,* and *br*); O. Insleayi (*i-h, y, br,* &c.); O. luteo-purpureum (*c-h, br* or *p, w,* and *y*); O. odoratum (*c-h, y, br,* and *p, sc*); O. Rossii (*c-h, w, br,* and *y*); O. R. Ehrenbergii (*c-h, w* and *br*); O. R. Warnerianum (*c-h, w, br, y,* &c.); Oncidium bicallosum (*i-h, br* and *y*); O. bifolium (*st, g-br* and *y*); O. Cavendishianum (*st, y*); O. crispum (*i-h, br* and *y*); O. cucullatum (*c-h, br-p* and *pi-p*); O. incurvum (*c-h, w, l,* and *br, sc*); O. leucochilum (*i-h, g, br* or *r,* and *w* or *y*); O. ornithorhynchum (*c-h, pi-p, sc*); O. o. albiflorum (*c-h, w*); O. tigrinum (*i-h, br* and *y, sc*); O. varicosum Rogersii (*i-h, y*); Oxalis variabilis (*c-h, w* or *r*; ¼); Peristrophe speciosa (*st, p*; 4); Phalænopsis Aphrodite (*st, w, r, o,* and *y*); Pitcairnia muscosa (*st, r*; 1); Pterostylis Baptistii (*c-h, g, w,* and *br*; 1); Ruellia Portellæ (*i-h, pi*; 1); Saccolabium giganteum (*st, w* and *m-v, sc*); Selenipedium Schröderæ (*st, p-r,* &c.); Sophronitis grandiflora (*c-h, r*); S. militaris (*c-h, r* and *y*; ½); S. violacea (*c-h, v*; ¼); Stelis Bruckmülleri (*st, y-p* and *p*); Talauma pumila (*st, c, sc*; 2-4); Thunbergia erecta (*st, b, o,* and *y*; 6) and var.; Tillandsia umbellata (*st, b, w,* and *g*; 1); Trichopilia fragrans (*c-h, y, g, w,* spotted *o, sc*); Zygopetalum brachypetalum (*i-h, br, w,* &c.); Z. candidum (*i-h, w* and *pi-p*; ¾); Z. crinitum (*c-h, g, br, w,* and *y*); Z. Dayanum (*st, w, p-v,* and *r*) and vars.; Z. Gairianum (*st, v, p,* and *o*); Z. Gautieri (*c-h, g, br,* and *p-b*); Z. Klabochorum (*i-h, p, w,* and *y*); Z. Mackayi (*c-h, p, g, w,* and *b*); Z. m. intermedium (*c-h, p, g, w,* and *b*); Z. maxillare (*c-h, br, b-p,* and *g*); Z. rostratum (*st, w, g, br-p,* &c.); Z. Sedeni (*i-h, p-br, g,* and *b-p*); Z. triumphans (*i-h, w* and *b*); Z. Wallisii (*c-h, w* and *v*).

SHRUBS.—Abutilon insigne (*c-h, p-r*; 6); A. megapotamicum (*c-h, r, y,* and *br*; 3); A. striatum (*c-h, o-y*; 10); Aphelandra aurantiaca (*st, o-r*; 3); Begonia incarnata (*st, pi*; 2); B. Lindleyana (*st, w*; 3); B. Lynchiana (*st, r*); B. nitida; (*st, pi*; 4-5); B. prestoniensis (*st, o-r*; 2); Bouvardia jasminiflora (*c-h, w, sc*; 2); Bursaria spinosa (*c-h, w*; 10); Camellia japonica (*c-h*; 20) and vars.; Crassula lactea (*c-h, w*; 1-2) and var.; Daphne odora Mazeli (*c-h, w* and *pi, sc*); Erica gracilis (*c-h, p-r*; 1); E. hyemalis (*c-h, pi* and *w*; 2); D. melanthera (*c-h, pi*; 2); D. ramentacea (*c-h, p-r*; 1½); Eupatorium atrorubens (*c-h, r* and *l*); E. ianthinum (*c-h, p*; 3); E. Weinmannianum (*c-h, w, sc*); Jasminum gracillimum (*st, w, sc*); J. Sambac (*st, w, sc*); Leonotis Leonurus (*c-h, r*; 3-6); Leucopogon australis (*c-h, w*; 2-4); L. Richei (*c-h, w*; 3-4); Libonia floribunda (*i-h, r* and *y*); L. Penrhosiensis (*i-h, r*); Mimulus glutinosus (*c-h, br* or *pi*; 5); Monochætum Hartwegianum (*c-h, pi*); M. Humboldtianum (*c-h, r-p*); Mussænda luteola (*c-h, y* and *o*; 5-6); Pentas carnea (*st, pi-w*; 1½); Pereskia Bleo (*st, r*; 8-10); Pleroma macranthum (*st, v-p*); Rhododendron javanicum (*c-h, o* and *r*; 4); Ruellia Baikiei (*i-h, r*; 3); Salvia splendens (*c-h, r*; 3) and var.; Senecio mikanioides (*c-h, y*); Stachytarpheta mutabilis (*st, r*; 3); Thyrsacanthus rutilans (*st, r*; 2); T. Schomburgkianus (*st, r*; 2); Whitfieldia lateritia (*st, r* and *o*; 3).

AN INDEX TO HEIGHTS OF HARDY AND HALF-HARDY HERBACEOUS PLANTS.

IN the arrangement of herbaceous beds and borders, the heights which the plants are likely to attain are an important consideration. To facilitate selection, the best hardy and half-hardy herbaceous plants, *i.e.*, those which, in the body of the work, have been marked by an asterisk, are here classified according to their degrees of height, in two divisions—"Flowering Plants" and "Foliage Plants."

Each plant is included under that heading which most nearly represents its greatest height; and the asterisks indicate plants between whose maximum and minimum heights a wide range is observable. Subjects which, in the body of the work, have been briefly described as, *e.g.*, "2ft." or "3ft." high, are here classed respectively under the headings "1½ft. to 2ft." and "2ft. to 3ft."

Abbreviated information as to the colours of the flowers or foliage, as the case may be, is given after each name.

The following abbreviations are used:—

b, blue; *bk*, black; *br*, brown; *c*, cream; *g*, green; *gl*, glaucous; *gy*, grey; *l*, lilac; *m*, magenta; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *si*, silvery; *v*, violet; *w*, white; *y*, yellow.

FLOWERING PLANTS. — 1in. to 3in. — ANNUALS.—Loasa prostrata (*y*); Nolana paradoxa (*b*); N. tenella (*b*); Sedum cœruleum (*b*); Silene pendula compacta (*pi*); Wahlenbergia hederacea (*b*).

PERENNIALS.—Acis roseus (*pi*); Ajuga reptans (*b* or *pi*); Allium Bidwelliæ (*pi*); A. Cepa (*w*); A. falcifolium (*pi*); Alyssum alpestre (*y*); Anemone ranunculoides (*y* or *p*); Anthemis Aizoon (*w* and *y*); Androsace argentea (*w*); A. carnea (*pi* and *y*); A. Laggeri (*pi*); A. villosa (*pi* or *pi-w*); A. Vitaliana (*y*); Arctotis acaulis (*y* and *r*); Arenaria balearica (*w*); Armeria juncea (*pi*); A. setacea (*pi*); Bellis perennis (*w*) and vars.; B. rotundifolia cœrulescens (*w* or *b*); Bellium minutum (*w* and *y*); Campanula cenisia (*b*); C. glomerata pusilla (*b* or *w*); C. Raineri (*b*); C. Zoysii (*b*); Claytonia virginica (*w*); Crocus aureus (*o*); C. biflorus (*w* or *gy-l*, feathered *p*); C. susianus (*o*, or *o* striped *br*); C. vernus (*l*, *v*, *w*, or streaked *w* and *v*); Cyclamen ibericum (*r*, spotted *p*); Draba aizoides (*y*);

Flowering Plants (1in. to 3in.)—*continued.*

D. Aizoon (*y*); D. alpina (*o*); D. glacialis (*o*); D. Mawii (*w*, tipped *r-br*); D. nivalis (*w*); Dracocephalum peregrinum (*b*); Eranthis sibiricus (*y*); Erodium Reichardi (*w*, veined *pi*); Erysimum ochroleucum (*y*); E. pumilum (*y*); Erythræa diffusa (*pi*); Gentiana bavarica (*b*); G. pyrenaica (*g* and *b*); G. verna (*b*); Geranium argenteum (*r*); Houstonia serpyllifolia (*w*); Leptinella dioica (*y*); Linaria hepaticæfolia (*l-p*); Lotus corniculatus (*y*); Lychnis Lagascæ (*pi* and *w*); Lysimachia Nummularia (*y*); Mazus pumilio (*v*); Mitchella repens (*p-w*); Myosotis alpestris (*b*); Oxalis Acetosella (*w*, veined *p* or *pi-p*); O. corniculata (*y*); O. lobata (*y*, spotted *r*); O. violacea (*pi*); Phlox reptans (*p* or *v*); Phyteuma humile (*b*); Pratia angulata (*w*); P. repens (*v-w*); Primula Auricula (*y*) and vars.; P. marginata (*v-pi*); P. minima (*pi* or *w*); P. sapphirina (*b*); P. scotica (*p*, *y* eye); P. Steinii (*p*); P. viscosa (*pi-p*, *w* eye) and vars.; P. vulgaris (*y*); Pyxidanthera barbulata (*w* or *pi*);

Flowering Plants (1in. to 3in.)—*continued.*

Saxifraga aizoides (*o* or *o-y*, spotted *r*); S. aretioides (*o-y*); S. Burseriana (*b-w*); S. Fortunei (*w*); S. moschata; S. oppositifolia (*p*); S. Rocheliana coriophylla (*w*); S. valdensis (*w*); Silene acaulis (*pi* or *w*); S. Hookeri (*pi*); Soldanella alpina (*v*); S. montana (*p*); Trifolium uniflorum (*w*); Viola Munbyana (*v* or *y*); V. odorata (*b*, *w*, or *r-p*, *sc*); V. pedunculata (*y*); V. varieties; Waldsteinia fragarioides (*y*).

3in. to 6in.—ANNUALS.—Alyssum serpyllifolium (*y*); Bellium bellidioides (*w*); Bivonæa lutea (*y*); Downingia elegans (*b*, streaked *w*); D. pulchella (*b* and *y*); Fedia Cornucopiæ (*r*); Nemophila Menziesii (*w* or *b*, spotted); Nolana lanceolata (*b*, *w*, *g*); Papaver alpinum (*y*, *pi* or *w*); Sedum sempervivoides (*r*); Tropæolum peregrinum (*y*).

BIENNIAL.—Sedum sempervivoides (*r*).

PERENNIALS.—Achillea Herba-rota (*w*); A. moschata (*w*); A. nana (*w*); A. umbellata (*w*); Acis autumnalis (*w* and *pi*); A. grandiflorus (*w*); A. trichophyllus (*w* and *r*); Aconitum biflorum (*b*); Ajuga pyramidalis (*b* or *p*); Alchemilla alpina (*g*); A. sericea (*g*); Ambrosinia Bassii (*g*); Androsace Chamæjasme (*p-w* and *y*, or *pi* and *y*); A. lactea (*w* and *y*); A. sarmentosa (*pi* and *w*); Anemone alpina (*w*, *w* and *p*, *c*, or *y*); A. apennina (*b*); A. baldensis (*w* and *b-r*); A. blanda (*b*); A. Halleri (*p*); A. nemorosa (*w*) and var.; A. stellata (*w*); A. vernalis (*v* and *w*); Arabis alpina (*w*); A. arenosa (*pi*); A. blepharophylla (*pi-p*); A. lucida (*w*) and var.; A. petræa (*w*); Arenaria grandiflora (*w*); A. laricifolia (*w*); A. purpurascens (*p*); A. rotundifolia (*w*); Armeria dianthoides (*pi*); A. juniperifolia (*pi*); Asperula longiflora (*w*, *y*, and *r*); A. montana (*pi*); Babiana disticha (*b*); B. plicata (*v-b*, *b*, and *y*); Biarum tenuifolium (*br-p*); Brodiæa gracilis (*y*, nerved *br*); Bupleurum graminifolium (*g-y*); Calceolaria Fothergillii (*y*, spotted *r*); Calochortus cœruleus (*l*, spotted *b*); C. Nuttallii (*g*, *w*, *r*, and *y*); Campanula Allionii (*b* or *w*); C. cæspitosa (*b* or *w*); C. Elatines (*b-p*); C. fragilis (*l-p*); C. garganica (*b*); C. nitida (*b* or *w*); C. pulla (*b*); C. pusilla (*b*, varying to *w*); C. Scheuchzeri (*b*); C. Waldsteiniana (*v-b*); Cardamine trifolia (*w*); Carpolyza spiralis (*w* and *r*); Cedronella cordata (*p*); Chrysogonum virginianum (*y*); Cineraria aurantiaca (*o*); Claytonia sibirica (*pi*); Clintonia uniflora (*w*); Conandron ramondioides (*w* or *p*); Coris monspeliensis (*l*); Cornus canadensis (*p-w*); C. suecica (*p* and *w*); Corydalis solida (*p*); Crocus Boryi (*c-w*, *o-y*, and *p*); C. Imperati (*l-p*, striped *p*); C. nudiflorus (*p* or *v*); C. speciosus (*l*, striped *p*); Cyclamen africanum (*w* or *pi*, spotted *p*); C. cilicicum (*w*, blotched *p*); C. Coum (*r*); C. neapolitanum (*w* or *r*, spotted *p-v*); C. persicum (*w*, blotched *r-p*); C. varieties; Dianthus alpinus (*pi*, spotted *r*); D. cæsius (*pi*); D. neglectus (*pi*); Dionæa muscipula (*w*); Dodecatheon integrifolium (*pi-r*); Drypis spinosa (*pi* or *w*); Erigeron grandiflorus (*p* or *w*); E. Roylei (*b-p* and *y*); Erinus alpinus (*p*); Erodium macradenum (*v*); Erysimum alpinum (*y*); Erythronium americanum (*y*); E. dens-canis (*p-pi* or *w*); Ferraria Ferrariola (*g-b*); F. undulata (*g-b*); Fritillaria armena (*y*); F. græca (*br*); F. Hookeri (*l*); Funkia Sieboldiana (*w* and *l*); Galanthus nivalis (*w*, streaked *g*) and vars.; G. plicatus (*g-w*); Galax aphylla (*w*); Gentiana acaulis (*b* and *y*) and vars.; G. algida (*b* and *b-w*, spotted and striped *b*); G. cruciata (*b*, dotted *g*); Geranium cinereum (*r*); Herbertia cærulea (*b* and *w*); Houstonia cærulea (*b*); Iris alata (*l-p* and *y*); I. Chamæiris (*y*, veined *br*, and *o-y*); I. cristata (*l* and *y*); I. iberica (*w*, *p*, and *p-br*); I. lutescens (*y*, veined *p-br*); I. persica (*y-l* and *y*); I. pumila (*l-p* and *w*); I. rubro-marginata (*g-p*); Ixia speciosa (*r*); Leontopodium alpinum (*w*); Leucoium vernum (*w*, spotted *g*); Linaria alpina (*b-v*); L. Cymbalaria (*b* or *l*) and var.; Linum alpinum (*b*); Lupinus lepidus (*p-b*); Lychnis alpina (*p*); L. pyrenaica (*w-pi*); Merendera Bulbocodium (*pi-l*); Milla biflora (*g-w* and *w*); Mimulus moschatus (*y*, *sc*); Mitella pentandra (*y*); Mœhringia muscosa (*w*); Muscari Elwesii (*b*); M. Szovitsianum (*b*); Nemastylis acuta (*b*, *y*, *bk*); Œnothera acaulis (*w*, turning *r*); Œ. bistorta

Flowering Plants (3in. to 6in.)—*continued.*

Veitchiana (*y*, spotted *p-r*); Œ. taraxacifolia (*w*, turning *r*); Omphalodes Luciliæ (*l-b*); O. verna (*b*); Orchis purpurea (*pi*, *g*, and *p*); Ornithogalum umbellatum (*w* and *g* striped); Oxalis arenaria (*v-p*); O. enneaphylla (*w* veined *p*, or *p*); Petasites fragrans (*w*); P. frigida (*w*); Phlox subulata (*p*); Phyteuma comosum (*p* or *w*); Polemonium confertum (*b*); P. humile (*b* or *p*); P. reptans (*b* or *w*); Potentilla ambigua (*y*); P. Saxifraga (*w*); Primula altaica (*m* or *p-r*); P. auriculata (*p*); P. Boveana (*y*); P. calycina (*p*); P. glutinosa (*b-p*); P. rosea (*pi*, *y* eye); Pyrola rotundifolia (*w*); Ranunculus anemonoides (*pi-w*); R. parnassifolius (*w* or *p*); Romanzoffia sitchensis (*w*); Romulea Bulbocodium (*v* and *y*); Sanguinaria canadensis (*r*); Saponaria ocymoides (*r* and *p*, or *pi* and *p*); Saxifraga Camposii (*w*); S. Maweana (*w*); S. purpurascens (*p*); Scabiosa Webbiana (*c-y*); Scilla amœna (*b* or *w*); S. bifolia (*b*, *r*, or *w*); S. sibirica (*b*); Silene alpestris (*w*); S. Saxifraga (*y* and *r-br*); S. Schafta (*p*); Sternbergia lutea (*y*) and var.; Tropæolum polyphyllum (*y*); T. speciosum (*r*); T. tricolorum (*o-r*, tipped *bk*); Tussilago Farfara variegata (*y*); Uvularia grandiflora (*y*); Viola cornuta (*b*); V. hederacea (*b* or *w*); V. pedata (*b* or *w*) and vars.; V. Riviniana (*b-p* or *l*); V. rothomagensis (*b*, striped *bk*); V. tricolor (variable); V. varieties; Wahlenbergia Kitaibelii (*p-b*); W. tenuifolia (*b-v* and *w*); Zephyranthes Andersoni (*o-y* or *r-y*).

6in. to 12in.—ANNUALS.—Adonis æstivalis (*r*); A. autumnalis (*r* and *bk*); Æthionema Buxbaumii (*r*); Æ. saxatilis (*p*); Alyssum gemonense (*y*); A. orientale (*y*); A. saxatile (*y*); Amarantus melancholicus ruber (*r*); Argemone albiflora (*w*); Bartonia aurea (*o*) Blumenbachia insignis (*r-y* and *w*); Borago longifolia (*b*); Brachycome iberidifolia (*b* or *w*); Calceolaria arachnoidea (*p*); C. plantaginea (*y*); Castilleja indivisa (*g-y*); Chlora perfoliata (*o-y*); Collinsia bicolor (*r-p* and *w*); C. grandiflora (*p* and *b*); C. verna (*b* and *w*); Crepis rubra (*r*); Erysimum Perofskianum (*r-o*); Gilia achilleæfolia (*p-b* or *r*); G. androsacea (*l*, *p*, or *w*); G. Brandegei (*o-y*); G. liniflora (*w*); G. micrantha (*pi* or *o-y*); G. tricolor (*p*, *w*, and *o-y*); Glaucium phœniceum (*r*, spotted *bk*); Iberis amara (*w*); I. coronaria (*w*); Lagurus ovatus (*g*); Lathræa squamaria (*pi-w* or *b-w*, streaked *p* or *r*); Linaria bipartita (*v-p* and *y*); L. spartea (*y*); Linum grandiflorum (*pi*); Lupinus nanus (*l* and *b*); Malope trifida (*p* or *w*); Mentzelia bartonioides (*y*); Mimulus luteus (*y*) and vars.; Nonnea rosea (*pi*); Papaver Rhœas (*r*); Phacelia campanularia (*b*, spotted *w*); P. viscida (*b* or *p*); Phlox Drummondii (*r*, varying to *pi*, *p*, or *w*); Reseda odorata (*r*, *y*, and *g*, *sc*); Sabbatia campestris (*pi*); Saponaria calabrica (*pi*); Selenia aurea (*o-y*); Silene Atocion (*pi*); Ursinia pulchra (*o*); Vesicaria grandiflora (*y*); Zaluzianskia capensis (*w*).

BIENNIALS.—Chlora grandiflora (*o-y*); Dianthus chinensis (variable).

PERENNIALS.—Achillea ageratum (*w*); A. Clavennæ (*w*); A. tomentosa (*y*); Actæa spicata (*w*) and var.; Actinella grandiflora (*y*); Adonis vernalis (*y*); Æthionema coridifolium (*pi-l*); Ainsliæa Walkeræ (*w* and *r*); Ajuga genevensis (*b-p* and *w*); Alchemilla pubescens (*g*); Allium acuminatum (*pi*); A. cœruleum (*b*), A. Macnabianum (*m*); A. Murrayanum (*pi-p*); A. paradoxum (*w*); Anchusa Agardhii (*p*); Androsace lanuginosa (*pi* and *y*); Andryala lanata (*y*); Anemone angulosa (*b*); A. multifida (*r*, *w-y*, or *y*); A. narcissiflora (*c*, or *c* and *p*); A. patens (*p* or *y*); A. pratensis (*p*); A. Pulsatilla (*v*); Aplectrum hyemale (*g-b*); Aquilegia alpina (*b*, or *b* and *w*); A. Bertoloni (*b-v*); A. glandulosa (*l-b*); A. pyrenaica (*l-b*); Arabis albida (*w*) and var.; A. rosea (*pi-p*); Arenaria graminifolia (*w*); Armeria plantaginea (*pi*); A. vulgaris (*pi*, *l*, or *w*); Arnebia echioides (*y*, spotted *p*); Arnica montana (*y*); A. scorpioides (*y*); Asarum canadense (*br*); Asperula odorata (*w*); A. orientalis (*b*); Aster alpinus (*p*); A. altaicus (*b-p*); A. argenteus (*p*); A. caucasicus (*p*); A. peregrinus (*b-p*);

Flowering Plants (6in. to 12in.)—*continued.*

A. pulchellus (*p*); Babiana ringens (*r*); B. stricta (*w, l-b,* blotched *b*) and vars; Bellevalia syriaca (*w*); Bellidiastrum Michelii (*w*); Biebersteinia odorata (*y*); Borago laxiflora (*b*); Brodiæa congesta (*b*) and vars.; Calochortus Benthami (*y*); C. elegans (*g-w, p*); C. lilacinus (*pi*); C. luteus (*y* and *p*); C. pulchellus (*y*); Camassia esculenta (*b*); C. Fraseri (*b*); Campanula alpina* (*b*); C. carpathica (*b* or *w*); C. c. turbinata (*p*); C. collina (*b*); C. excisa (*b*); C. isophylla alba (*w*); C. Portenschlagiana (*b-p*); C. rotundifolia (*b* or *w*); C. r. soldanellæflora (*b*); Cerinthe major (*y* and *p*); Chelone nemorosa (*pi-p*); Chionographis japonica (*w*); Chrysanthemum argenteum (*w*); Cnicus undulatus (*p*); Coreopsis Drummondi (*y* and *r-br*); Corydalis lutea (*y*); C. Marschalliana (*y*); C. nobilis (*y*, tipped *g*); Cotyledon agavoides (*o*); Cypella Herberti (*y*); Cypripedium arietinum (*g-br*, and *r* veined *w*); C. guttatum (*w*, blotched *pi-p*); C. macranthum (*p*); Dentaria diphylla (*p* and *w*); D. polyphylla (*c*); Dianthus alpestris (*r*); D. atrorubens (*r*); D. fimbriatus (*pi*); D. fragrans (*w*, suffused *p*); D. plumarius (*w, p,* &c.); D. Seguierii (*pi-p*); D. varieties; Doronicum altaicum (*y*); D. caucasicum (*y*); Draba violacea (*v-p*); Dracocephalum altaiense (*b*); Epimedium alpinum (*r, gy,* and *y*); E. Musschianum (*w*); E. rubrum (*r*); Eranthis hyemalis (*y*); Erigeron aurantiacus (*o*); E. glaucus (*p*); Erythræa Muhlenbergi (*pi* and *g-w*); Eschscholtzia californica crocea (*o, w,* or *r*); Eucomis nana (*br*); Fritillaria delphinensis (*p,* spotted *y*); F. lutea (*y* and *p*); F. Meleagris (*p,* chequered); F. pallidiflora (*y,* chequered); F. pudica (*y*); F. tenella (*y,* chequered *p-br*); F. tulipifolia (*b*); Galanthus Elwesii (*w,* spotted *g*); Gazania uniflora (*y*); Gentiana affinis (*b*); G. Pneumonanthe (*b*); Geranium Endressii (*pi*); G. ibericum (*b*); G. Lamberti (*l*); G. macrorhizon (*r* or *p*); G. striatum (*pi*); G. Wallichianum (*p*); Geum montanum (*y*); G. triflorum (*w,* edged *p-r* and *p*); Gladiolus floribundus (*w, p, r,* &c.); Helichrysum arenarium (*y*); Hemerocallis minor (*y*); Heteranthera limosa (*v-b*); Heteropappus hispidus (*w*); Hyacinthus orientalis (variable); H. varieties (*sc*); Iris balkana *l-p*); I. Douglasiana (*l-p*); I. graminea (*l-p*); Ixia hybrida (*w*); I. maculata (*o,* spotted); I. patens (*pi*); I. viridiflora (*g,* spotted); Kœniga spinosa (*w*); Lilium elegans atrosanguineum (*r,* dark blotched); L. tenuifolium (*r*); Limnanthes Douglasii (*y,* turning *w*); Linaria triornithophora (*p* and *y*); Linum angustifolium (*p*); L. Macraei (*o*); Lithospermum purpureo-cæruleum (*r,* turning *p*); Lupinus subcarnosus (*b,* blotched *y*); Lychnis fulgens (*r*) and vars.; L. Viscaria (*pi*); Lysimachia punctata (*y*); Marshallia cæspitosa (*b-w*); Meconopsis cambrica (*y*); Mimulus Lewisii (*pi*); M. luteus (*y*) and vars.; Moltkia petræa (*pi-b,* turning *v-b*); Moræa tricuspis (*g-w,* spotted *p*); M. unguiculata (*w,* spotted *p-r*); Muscari botryoides (*b*); M. moschatum (*p*); M. neglectum (*b*); M. paradoxum (*b-bk* and *g*); M. racemosum (*b*); Myosotis azorica (*p,* turning *b*); M. dissitiflora (*b*); M. palustris (*b*); Narcissus Broussonetii (*g-w*); N. Bulbocodium (*y*) and vars.; N. calathinus (*w* or *y*); N. incomparabilis (*y*) and vars.; N. Jonquilla (*y*); N. Macleai (*y* and *w*); N. poeticus (*w*); N. Pseudo-Narcissus (*y*) and vars.; N. Tazetta (*y* and *w*) and vars.; N. triandrus (*w*); Neja gracilis (*y*); Nierembergia filicaulis (*l* and *y*); Œnothera eximia (*w*); Œ. glauca Fraseri (*y*); Onosma stellulatum tauricum (*y*); Ophrys apifera (*pi* and *g*); O. Speculum (*g, b,* edged *y,* margined *r-p*); Opuntia Rafinesquii (*y* and *r*); Orchis latifolia (*p* or *r*); O. maculata (*p* or *w,* spotted *p-b*); Orobus pannonicus (variable); O. vernus (*p* and *b,* veined *r,* turning *b*); Ourisia coccinea (*r*); O. Pearcei (*r,* striped *r-p*); Pedicularis verticillata (*pi* or *w*); Pentstemon azureus (*b*); P. deustus (*y*); P. glaber (*p, v,* or *b*); P. gracilis (*l-p* or *w*); P. Menziesii Douglasii (*l-p* and *pi-r*); P. pubescens (*v* or *p*); Petalostemon candidus (*w*); P. violaceus (*pi-p*); Plumbago Larpentæ (*v*); Podophyllum Emodi (*w*); Polygonum affine (*pi-r*); Potentilla unguiculata (*w*); Primula capitata (*v-b*); P. cortusoides (*pi*); P. denticulata (*l*) and vars.; P. farinosa* (*p, y* eye); P. involucrata (*c-w*)

Flowering Plants (6in. to 12in.)—*continued.*

and vars.; P. nivalis (*w*); P. obconica (*l* or *p*); P. sinensis (*w* or *l*); Pulmonaria augustifolia (*pi,* turning *b*); P. saccharata (*pi*); Puschkinia scilloides (*w,* striped *b*); Pyrethrum corymbosum (*w*); Ranunculus amplexicaulis* (*w*); R. asiaticus vars.; R. gramineus (*y*); Rhexia virginica (*p*); Sarracenia psittacina (*p*); S. purpurea (*p*); Saxifraga Hirculus (*y,* dotted *r*); S. Hostii (*w,* dotted *p*); S. ligulata (*w,* dotted *pi*); S. longifolia (*w,* dotted *r*); S. umbrosa (*w,* sprinkled *r*); S. virginiensis (*w*); Scabiosa caucasica (*b*); Scilla chinensis (*pi-p*); S. hispanica (*b,* turning *pi-p*); S. peruviana (*l, r,* or *w*); S. pratensis (*b*); Scopolia carniolica (*p* or *g,* veined); Sempervivum arenarium (*y*); Senecio Doronicum (*y*); Serapias cordigera (*br* and *l*); Silene Elizabethæ (*pi*); S. pennsylvanica (*pi*); Sisyrinchium filifolium (*w,* lined *p-r*); S. grandiflorum (*p*); S. iridifolium (*y-w*); Stachys grandiflora (*v* and *p*); Statice callicoma (*p*); S. latifolia (*b*); S. sinuata (*p* and *y*); S. Suworowi (*l*); S. tatarica (*r*); Stylophorum diphyllum (*y*); Tanacetum leucophyllum (*o-y*); Thalictrum anemonoides (*w* or *pi*); T. tuberosum (*w*); Trifolium alpestre (*p*); Trillium erectum (*p*); T. erythrocarpum (*w,* striped *p*); Triteleia porrifolia (*w-v*); T. uniflora (*l*); Tritonia miniata (*r*); Tulipa Greigi (*r,* blotched *bk*); Uvularia sessilifolia (*y*); Vesicaria utriculata (*y*); Vicia argentea (*pi*); Viola cucullata (*v-b* or *p*); Zephyranthes Atamasco (*w*); Z. carinata (*g* and *p*); Z. rosea (*pi*).

1ft. to 1½ft.—Annuals.—Alyssum Wiersbeckii (*y*); Chrysanthemum segetum (*y*); Collomia coccinea (*r*); Gomphrena globosa (variable); Helipterum Manglesii (*y* or *p*); Lupinus luteus (*y*); Madia elegans (*y*); Nemophila insignis (*b* and *w*); Œnothera Whitneyi (*pi-r,* blotched *r*); Sabbatia calycosa* (*w*); Streptanthus maculatus (*p*); Tagetes patula (*o-y*).

Biennials.—Anchusa capensis (*b*); Blumenbachia coronata (*w*); Campanula sibirica divergens (*v*); C. thyrsoidea (*b*); Scrophularia chrysantha (*o-y*); Tragopogon glaber (*p*).

Perennials.—Abronia arenaria (*y*); Achillea asplenifolia (*pi*); A. aurea (*o-y*); Actæa alba (*w*); Adenophora denticulata (*b*); A. Fischeri (*b* or *w-b*); A. pereskiæfolia (*b*); A. stylosa (*b*); Adonis pyrenaica (*y*); Æthionema grandiflorum (*pi*); Ajuga orientalis (*b*); Allium Moly (*y*); A. neapolitanum (*w* and *g*); A. roseum (*l-pi*); Anemone decapetala (*c* or *y-w*); A. dichotoma (*w,* tinged *r*); A. rivularis* (*w* and *p*); A. sylvestris (*w*); Anthericum Liliago (*w*); Antirrhinum tortuosum (*p*); Aquilegia cærulea (*b, w,* and *l*); A. olympica (*mv-b* and *w*); Arctotis speciosa (*y*); Armeria cephalotes (*pi* or *r*); Aster pyrenæus (*l-b* and *y*); A. salsuginosus (*v-p*); Boltonia glastifolia (*pi*); Brodiæa grandiflora (*b-p*); B. multiflora (*b-p*); Buphthalmum grandiflorum (*y*); B. salicifolium (*y*); Calceolaria amplexicaulis (*y*); C. corymbosa (*y,* spotted *p*); C. varieties; Calochortus albus (*w,* blotched); C. splendens (*l*); Campanula barbata* (*b* or *w*); C. bononiensis (*b-v*); C. carpathica pelviformis (*l*); C. speciosa (*b, p,* or *w*); C. Tommasiniana (*b*); Cardamine asarifolia (*w*); C. pratensis (*p* or *w*); Centaurea dealbata (*pi*); C. suaveolens (*y*); Cerinthe maculata (*y,* spotted *p*); C. minor (*y,* spotted *br*); C. retorta (*y*); Cheiranthus Marshalli (*o*); Comarum palustrum (*p-br*); Commelina cœlestis (*b* or *w*); Coreopsis auriculata (*y* and *p-br*); Cynanchum roseum (*pi-r*); Darlingtonia californica (*w* or *g,* and *y-g,* veined *r-br*); Delphinium Ajacis (*b, r,* or *w*); D. cashmirianum (*b*); D. nudicaule (*r*); Dentaria digitata (*p*); Dianthus superbus* (*pi*); Dicentra formosa (*r*); Dictamnus albus (*w* or *p*); Dodecatheon Meadia (*p-r, w,* or *l*) and vars.; Doronicum austriacum (*y*); Dracocephalum austriacum (*b*); Epimedium macranthum (*w* or *v*); E. pinnatum (*y*); Erigeron speciosus (*v* and *y*); Fritillaria pyrenaica (*p*); Funkia ovata (*b-l* or *w*); Gaillardia aristata (*y* and *r*); Gazania Pavonia (*y,* spotted *br* or *w*); G. splendens (*o,* spotted *bk* and *w*); Gentiana quinqueflora (*l*); G. septemfida* (*b*); Geranium atlanticum (*p,* veined *r*); G. dahuricum (*p*); G. maculatum

Flowering Plants (1ft. to 1½ft.)—*continued.*

(*l*); G. phœum (*br*, spotted *w*); Geum coccineum * (*r*); G. pyrenaicum (*y*); Gillenia trifoliata (*w* to *r*); Gladiolus Colvillei (*r* and *p*); G. varieties; Helicodiceros crinitus (*p-br*); Helleborus niger * (*w*); Hemerocallis Dumortieri (*o*, tinged *br*); Heuchera americana (*r*); Hieracium aurantiacum (*o*); Hyacinthus varieties (*sc*); Iris biflora (*v-p* and *y*); Lactuca tuberosa (*b*); Leucoium æstivum (*w*); Lilium elegans sanguineum (*p-r* and *o-y*); L. oxypetalum (*l-p*, spotted *p*); L. roseum (*l*); Linaria macroura (*y*); Linum flavum (*o-y*); Lithospermum Gastoni (*b*); Lupinus nootkatensis (*b*, mixed *p*, *w*, or *y*); Lychnis chalcedonica (*r*); Monarda didyma (*r*); Morina Coulteriana (*y*); Muscari comosum monstrosum (*b-v*); Nierembergia frutescens (*b*, edged *w*); Nigella orientalis (*y*, spotted *r*); Œnothera linearis (*y*); Ornithogalum narbonense (*w*, striped *g*); O. thyrsoides (*y*); Orobus aurantius (*y*); Pæonia tenuifolia (*r*); Papaver nudicaule (*o*, *y*, or *w*); Pedicularis dolichorhiza (*o-y*); Pelargonium ardens (*r*); Pentstemon antirrhinoides (*y*); P. baccharifolius (*r*); P. campanulatus (*pi*, *p*, or *v*); P. confertus * (*y*); P. diffusus (*p*); P. Eatoni (*r*); P. heterophyllus (*pi* or *pi-p*); Phlomis herba-venti (*p-v*); Phlox amœna * (*p*, *pi*, or *w*); P. divaricata (*l* or *b*); P. ovata (*r-p*); Physochlaina physaloides (*p-v*); Potentilla Hopwoodiana (*pi* and *y*); Primula japonica (variable); P. Parryi * (*p*, *y* eye); P. Stuartii (*o-y*); P. verticillata simensis (*y*); Rhexia ciliosa (*p*); Ruscus Hypophyllum (*r*); Sagittaria sagittifolia * (*w* and *p*); Salvia carduacea (*l*); Saxifraga diversifolia (*y*); S. granulata (*w*); Scilla hyacinthoides (*b-l*); S. nutans (*b*, *p*, *w*, or *pi*); Scorzonera undulata (*p-pi*); Spigelia marilandica (*y* and *r*); Stachys lanata (striped); S. Maweana (*y*, blotched *p*); Streptopus roseus (*pi-p*); Teucrium Chamædrys (*pi*); Thermopsis barbata (*p*); Trifolium Lupinaster (*p*); Trillium grandiflorum (*w*, turning *pi*); Triteleia laxa (*b*); Tulipa Clusiana (*w*, *r*, and *bk*); T. Oculus-solis (*r*, blotched *bk* and *y*); T. præcox (*r*, *bk*, and *y*); T. varieties; Wulfenia carinthiaca (*b*).

1½ft. to 2ft.—ANNUALS.—Acroclinium roseum (*pi*); Argemone hirsuta (*w*); Borago officinalis (*b*, *p*, or *w*); Callistephus chinensis (*p*); Centranthus macrosiphon (*pi-r* or *w*); Clarkia elegans (*pi*) and vars.; C. pulchella (*p*); Collomia grandiflora (*r-y*); Coreopsis tinctoria (*y*, blotched *p-br*); Datura Metel (*w*); Gilia capitata (*b*); Heliotropium convolvulaceum (*w*); Helipterum Humboldtianum (*w*); Impatiens Balsamina (*r*); Loasa vulcanica (*w*); Mathiola annua (variable); Mentzelia ornata (*w*); Mirabilis Jalapa (variable); M. multiflora (*p*); Moricandia sonchifolia (*v-b*); Nicotiana suaveolens (*w*, *sc*); Nigella damascena (*w* or *b*); N. hispanica (*b*); Œnothera amœna (*pi*, spotted *r*) and vars; Panicum capillare (*g*); P. miliaceum (*g*); Papaver Rhœas umbrosum (*r*, blotched *bk*); Phacelia Whitlavia (*b*); Salpiglossis sinuata (*p*, *y*, &c., striped); Salvia coccinea (*r*); Schizanthus candidus (*w*); S. Grahami (*l* or *pi*, and *y*, tipped *l*); S. pinnatus (*v* or *l*); Schizopetalon Walkeri (*w*); Scutellaria Hartwegi (*r* and *v*); Senecio elegans (*p* and *y*); Tagetes erecta (*y*); T. tenuifolia (*y*); Vicia onobrychioides (*p*); Xeranthemum annuum (*p*); Zinnia elegans (*r*, *pi*, buff, or *w*).

BIENNIALS.—Ageratum mexicanum (*l-b*); Anarrhinum bellidifolium (*w* or *b-w*); Celsia betonicæfolia (*y*, spotted *p*); Glaucium flavum (*y*).

PERENNIALS.—Abronia fragrans (*w*, *sc*); A. umbellata (*pi*); Achillea ægyptiaca (*y*); A. Ptarmica flore-pleno (*w*); A. serrata (*w*); Aconitum delphinifolium (*b-p*); A. Gmelini (*c*); A. gracile (*b* or *v*); A. rostratum (*v*); A. Anthora (*y*); A. pyrenaicum (*y*); Adenophora coronopifolia (*b*); A. Lamarckii (*b*); Allium azureum (*b*); A. sphærocephalum (*r-p* and *g*); Amaryllis Belladonna (*w*, *r*, or *p*); Anemone virginiana (*p-g* or *p*); Anthericum Liliastrum (*w* and *g*); A. ramosum (*w*); Antirrhinum majus (variable); Aquilegia canadensis (*r* and *y*); A. fragrans (*w* or *p*, *sc*); Arctotis arborescens (*w* and *pi*); Arnica Chamissonis (*y*); A. foliosa (*y*); Asclepias acuminata (*r* and *w*); A. tuberosa (*o*); Asphodelus albus (*w*); A. creticus (*y*); Aster acris (*b*); A. acuminatus (*v*); A. æstivus (*b*); A. Amellus (*p*) and vars; A. concinnus (*p*); A. dumosus (*w*) and vars.; A. elegans (*b*); A. grandiflorus (*p*); A. hyssopifolius (*w* or *p-w*); A. lævis (*b*); A. linifolius (*w*); A. formosus (*pi*); A. pendulus (*w*, turning *pi-w*); Astilbe japonica (*w*) and vars.; Baptisia alba (*w*); Bessera elegans (*r*, or *r* and *w*); Boltonia asteroides (*w-pi*); Bravoa geminiflora (*o-r*); Brodiæa capitata (*v-b*); B. Howellii (*p-b*); B. lactea (*w* and *g*); Buphthalmum speciosissimum (*y*); Camassia Leichtlini (*c-w*); Campanula glomerata (*b-v* or *w*); C. grandis (*v-b* or *w*); C. latifolia macrantha (*p-b*); C. nobilis (*r-v*, *w*, or *c*, spotted); C. peregrina (*v*); C. sarmatica (*b*); C. Van Houttei (*b*); Caryopteris Mastacanthus (*v*); Centaurea aurea (*o-y*); C. montana (*b*); C. ragusina (*y*); Cheiranthus Cheiri (variable, *sc*); Chlorogalum pomeridianum (*w*, veined *p*); Chrysanthemum carinatum (*w* or *p*); Cineraria maritima (*y*); Clintonia Andrewsiana (*pi*); Cnicus acaulis (*p*); Coreopsis verticillata (*o*); Crinum capense (*g*, flushed *r*); Cypripedium parviflorum (*br-p* and *y*); Delphinium grandiflorum * (*b* to *w*); Dicentra spectabilis * (*pi-r* or *w*); Dracocephalum japonicum (*w* and *b*); Eremurus himalaicus (*w*); E. spectabilis (*y*); Erigeron multiradiatus (*p* and *y*); Erodium Manescavi (*p-r*); Eryngium alpinum (*b*); E. amethystinum (*b*); E. Bourgati (*b*); Eucomis punctata (*g* and *br*); Francoa appendiculata (*r*); F. sonchifolia (*pi*); Fritillaria recurva (*r*); Funkia grandiflora (*w*); F. subcordata (*w*); Gentiana Andrewsii * (*b*); G. Burseri (*y*); G. punctata (*y*, spotted *p*); Geranium sanguineum (*r*); G. sylvaticum (*p* or *b*, veined *r*); Gladiolus blandus (*w* and *r*); G. brachyandrus (*r*); G. varieties *; Gypsophila Stevenii (*w*); Hesperis tristis (*w*, *w-pi*, *br-r*, or *p*); Hottonia palustris (*l* and *y*); Inula glandulosa (*y*); I. Hookeri (*y*); Iris filifolia (*p*, keeled *y*); I. Guldenstadtiana (*w* and *y*); I. lævigata (*p*, blotched *y*); I. neglecta (*l*, *w*, and *y*); I. sambucina (*r-p* and *y*); I. vulgare * (*p*); I. xiphioides * (*p* and *y*); Kniphofia Rooperi (*o-r*, turning *y*); Lilium Catesbæi (*o-r*, spotted *p*); L. japonicum (*w* and *p-w*); L. longiflorum (*w*); Linum narbonense (*b* or *w*); Lobelia cardinalis (*r*); L. fulgens (*r*); L. splendens (*r*); L. syphilitica (*b*); Lupinus ornatus (*b*); L. perennis (*b*); Lysimachia atropurpurea (*p*); Meum athamanticum (*w*); Morina longifolia (*w*); Myosotis sylvatica (*b*); Nicotiana acutiflora (*w*); Nothoscordum fragrans (*w*, barred *l*, *sc*); Œnothera californica (*w* and *y*, turning *pi* and *y*); Œ. glauca (*y*); Ononis Natrix (*y*, veined *r*); Ornithogalum arabicum (*w*); O. pyramidale (*w*, striped *g*); Pæonia Wittmanniana (*y-w*); Papaver pilosum * (*r* or *o*); Pentstemon Hartwegi (*r* or *p-r*); P. venustus (*p*); Phlomis cashmeriana (*l*); Phlox glaberrima (*r* or *pi*); P. maculata (*p*) and vars.; P. pilosa (*pi*, *p*, or *w*); Polemonium cæruleum (*b*); Polygonum compactum (*w*); Potentilla congesta (*w*); Primula luteola (*y*); P. sikkimensis (*y*); Psoralea melilotoides (*p*); Pyrethrum achilleæfolium (*o-y*); P. roseum (*pi* and *y*); P. Tchihatchewii (*w* and *y*); Ranunculus aconitifolius * (*w*); R. cortusæfolius (*y*); Salvia asperata (*w*); S. coccinea (*r*); S. hians (*b*); S. Rœmeriana (*r*); Sarracenia Drummondii (*p*); S. flava (*y*); Saxifraga Cotyledon (*w*); S. peltata (*w* or *pi*); Sedum maximum * (*g* or *g-p*); S. spectabile (*pi*); Senecio pulcher (*p* and *y*); Silene virginica (*pi*); Smilacina stellata (*w*); Spiræa palmata (*r*); Sprekelia formosissima (*r* or *w*); Statice elata (*b*); S. floribunda (*v-b*); Tephrosia virginiana (*y-w*); Thermopsis montana (*y*); Tradescantia virginica (*v*, *p*, or *w*); Tritonia crocata (*y*); Trollius europæus * (*y*); Tulipa Eichleri (*r*, blotched *bk*, and bordered *y*); T. Gesneriana (*r*) and vars.; T. sylvestris (*y*); Verbena venosa (*l* or *b*); Veronica incana (*b*); Xerophyllum asphodeloides (*w*).

2ft. to 3ft.—ANNUALS.—Amarantus caudatus (*r-p*); Centaurea americana (*r*); C. Cyanus (*p*); Datura fastuosa (*v* and *w*); Gaillardia amblyodon (*r*); Lamarckia aurea (*g*); Lunaria annua (*v-l*); Nicotiana affinis (*w*, *sc*); N. longiflora (*w*, turning *p* or *y-g*); Perilla ocimoides crispa (*w*); Scabiosa atropurpurea (*r*).

Flowering Plants (1½ft. to 2ft.)—*continued.*

Flowering Plants (2ft. to 3ft.)—*continued.*

BIENNIALS.—Aster Bigelovii (*l* and *y*); Grindelia grandiflora (*y* or *o*); Meconopsis simplicifolia (*v-p*); Salvia bicolor (*b-v*, dotted *y* and *w*); Verbascum Chaixii (*y*); V. phœniceum (*v* or *r*).

PERENNIALS.—Acanthus montanus (*pi*); Achillea macrophylla (*w*); A. millefolium roseum (*pi*); Aconitum angustifolium (*b*); A. paniculatum (*v*); A. vulparia (*y*); A. Willdenovii (*b-p*); Acorus Calamus (*y*); Actinomeris alata (*y*); A. helianthoides (*y*); A. squarrosa (*y*); Adenophora verticillata (*b*); Agrimonia odorata (*y*); Allium nigrum (*v*, or *w* and *g*); Althæa caribæa (*pi*, *y*); A. flexuosa (*r*); Amsonia salicifolia (*b*); A. Tabernæmontana (*b*); Anemone japonica (*pi-r*); A. j. alba (*w*); A. j. elegans (*pi*) and vars.; Anemonopsis macrophylla (*p* and *l*); Aquilegia atropurpurea (*p* or *b-v*); Asclepias amœna (*p* and *r*); Aster dracunculoides (*w*); A. ericoides (*w*); A. longifolius (*w*); A. multiflorus (*w*); A. sikkimensis (*p*); A. Tradescanti (*w*); A. versicolor (*w*, turning *p*); Astilbe rivularis (*y-w* or *r*); Baptisia perfoliata (*y*); Brodiæa coccinea (*r* and *y-g*); Bupleurum longifolium (*g-y*); Calochortus purpureus (*g*, *p*, and *y*); Campanula persicæfolia (*b*, varying to *w*; C. Rapunculus (*b* or *w*); C. Trachelium (*b*, varying to *w*); Cedronella mexicana (*p*); Centaurea atropurpurea (*p*); C. alpina (*y*); Centranthus ruber (*r* or *w*); Cheiranthus mutabilis (*c*, turning to *p*, or striped); Chelone obliqua (*p* or *w*); Chrysanthemum sinense (variable); Chrysobactron Hookeri* (*y*); C. Rossii (*y*); Cimicifuga americana (*w*); C. japonica (*w*); Clematis recta (*w*); C. tubulosa (*b*); Cypripedium spectabile* (*w* and *pi*); Delphinium azureum (*b*); D. formosum* (*b*); Digitalis ambigua (*y* and *br*); Doronicum Pardalianches (*y*); Echinops Ritro (*b*); Eulalia japonica (*p*) and vars.; Francoa ramosa (*w*); Fritillaria imperialis (variable); F. macrophylla (*pi*); F. persica (*v-b*); Gaillardia pulchella (*r*, tipped *y*); Geranium pratense (*b*); Geum rivale* (*r*); Gladiolus cruentus (*r* and *y-w*); G. cuspidatus (*p* and *r*); G. Papilio (*p* and *y*); G. psittacinus (*r*, *g*, *p*, spotted *y*); G. Saundersii (*r*, spotted *w*); Gypsophila paniculata (*w*); Helianthus rigidus (*y*); Hemerocallis flava (*o*, *sc*); H. Middendorfi (*y*); Hesperis matronalis (variable, *sc*); Hypericum perforatum (*y*, dotted *bk*); Iris flavescens (*y*); I. florentina (*w*, *l*, *g*, *br*, and *y*); I. fœtidissima (*b-l*); I. fulva (*y-br*); I. germanica (*p*, *y*, and *w*); I. Pseudo-acorus (*o-y*, veined *br*); I. sibirica (*l-b*, veined *v*); Lactuca alpina (*p-b*); Leucothoë axillaris (*w*); Lilium canadense* (*y* to *r*, spotted); L. candidum (*w*); L. chalcedonicum (*r* or *y*); L. concolor Buschianum* (*r*, spotted *bk*); L. davuricum (*r*); L. Leichtlinii (*y*, spotted *p-r*, *p*, and *r*); L. Martagon (*p-r*, spotted *p*); L. monadelphum (*y* and *p-r*); L. philadelphicum (*o-r*, spotted *p*); L. pomponium (*r*, or *r* and *o*); L. speciosum* (*w*, spotted *p-r*) and vars.; Linaria purpurea (*b-p*, striped *p*); Lophanthus anisatus (*b*); Lychnis coronaria (*r*); L. diurna* *p-pi*); L. vespertina* (*w*); Lysimachia ciliata (*y*); L. clethroides (*w*); L. vulgaris (*y*); Lythrum Græfferi (*pi*); Malva Alcea fastigiata (*r*); M. moschata (*pi* or *w*); Mimulus cardinalis* (*r*); Nolina georgiana (*w*); Œnothera speciosa (*w*, turning *pi*); Orchis foliosa (*p*); O. militaris (*p*); Pæonia albiflora (*w*); P. Emodi (*w*); P. Moutan (variable); P. officinalis (*r*); Papaver orientalis (*r*, spotted *p*); Pentstemon barbatus (*pi-r*); P. Murrayanus (*r*); Polygonatum biflorum (*g*); P. multiflorum (*w*); Polygonum amplexicaule (*pi-r* or *w*); Potentilla argyrophylla (*y*); Rudbeckia pinnata (*y*); R. speciosa (*y* and *bk-p*); Sagittaria heterophylla (*w*); Salvia discolor (*p* and *v-b*); S. patens (*b*); S. Sclarea (*w-b*); Saponaria officinalis* (*l* or *w*); Scabiosa amœna (*l* or *p*); Scolymus grandiflorus (*y*); Silene maritima (*w*); Solidago Drummondii* (*y*); S. lanceolata (*y*); Spiræa Filipendula (*w* or *pi*); Symphytum caucasicum (*b*); S. officinalis (*r* or *r-p*) and vars.; Tricyrtis hirta* (*w*, dotted *p*); T. macropoda* (*w-p*, dotted *p*); T. m. striata (*w-p*, dotted *p*); T. pilosa (*w*, spotted *p*); Veratrum nigrum (*bk-p*); Zygadenus glaberrimus (*w*).

Flowering Plants—*continued.*

3ft. to 4ft.—ANNUALS.—Bartonia albescens* (*y*); Chrysanthemum coronarium (*y*); Delphinium cardinale (*r*); Helichrysum bracteatum (variable); Linaria reticulata* (*p* and *y*); Loasa Pentlandii (*o*); Nicandra physaloides* (*b*); Nicotiana Tabacum (*pi-w*); Papaver Hookeri (*pi* or *r*, blotched *w*, or *b-bk*); P. somniferum (variable); Ranunculus Lyalli (*w*); Solanum Fontanesianum (*y*).

BIENNIALS.—Bartonia albescens (*y*); Campanula Medium (*b*, *w*, and *w*); Centaurea macrocephala (*y*); Œnothera biennis (*y*); Silphium Marianum (*pi-p*).

PERENNIALS.—Acanthus longifolius* (*p-pi*); A. mollis (*w* and *p*); A. spinosissimus (*pi*); A. spinosus (*p*); Aconitum autumnale (*b-p*); A. eminens (*b*); A. Napellus (*b*); A. ochroleucum (*c*); A. Ottonianum (*b* and *w*); A. septentrionale (*b*); A. tauricum (*b*); Aquilegia chrysantha (*g-y*) and var.; A. formosa (*r* and *g*); Aster Douglasii (*p*); A. floribundus (*p*); A. novæ-belgii (*b*); A. paniculatus (*b*); Baptisia exaltata (*b*); Calceolaria lobata* (*y*); C. Pavonii* (*y* and *br*); Campanula rapunculoides* (*b-v*); Chelone Lyoni (*p*); Coreopsis grandiflora (*y*); Echinacea angustifolia* (*l* or *pi*); E. purpurea (*r-p* and *gy-g*); Eryngium giganteum (*b*); Galega officinalis (*b* or *w*); G. orientalis* (*b*); Galtonia candicans (*w*); Gaura Lindheimeri (*pi-w*); Gladiolus cardinalis (*r*, spotted *w*); G. purpureo-auratus (*o-y*, blotched *p*); Glycyrrhiza glabra (*b*); Gypsophila cerastioides (*w*, veined *r*); Hedysarum coronarium (*r*); Hemerocallis fulva (*y*); Incarvillea Olgæ (*pi*); Iris aurea (*y*); I. Monnieri (*y*); Kerria japonica (*o-y*); Kniphofia aloides (*pi-r*, turning *o* and then *g-y*); Lilium auratum* (*w* and *y*, spotted *p*); L. bulbiferum (*r*); L. cordifolium (*w*, *y*, *p*); L. Hansoni (*r-o*, dotted *p*); L. Krameri (*r-w*); L. pseudo-tigrinum (*r*, spotted *bk*); L. pyrenaicum (*y*); L. tigrinum (*o-r*, spotted *p-bk*); Lupinus polyphyllus (*b*); Moræa edulis (*v*); Papaver bracteatum (*r*); Pedicularis Sceptrum-Carolinum (*o-y*); Phlox paniculata (*pi-p*, varying to *w*); Prenanthes purpurea (*p*); Romneya Coulteri (*w*); Rudbeckia grandiflora (*y* and *p*); R. purpurea (*p*); Salvia indica (*y*, spotted *p*); S. interrupta (*v-p* and *w*); Senecio Doria (*y*); Silphium trifoliatum* (*y*); Smilacina oleracea (*w*, tinged *pi*); Spiræa Ulmaria* (*w*); Trillium nivale (*w*); Tritonia Pottsii (*r* and *y*); Urginea maritima* (*g-w*); Veratrum album (*g-w*).

4ft. to 5ft.—ANNUALS.—Amarantus hypochondriacus (*r*) and var.; A. speciosus (*r-p*).

BIENNIALS.—Digitalis purpurea (*p*, edged *w*); Meconopsis nepalensis (*o-y*).

PERENNIALS.—Achillea Eupatorium (*y*); Aconitum album (*w*); Baptisia australis (*b*); Cimicifuga racemosa (*w*); Dicentra chrysantha (*o*); Doronicum plantagineum excelsum (*y*); Epilobium hirsutum (*w-pi* or *w*); Leucothoë Davisiæ (*w*); Lilium Washingtonianum (*p-w*); Lophanthus scrophulariæfolius (*p*); Lythrum Salicaria (*r-p*); Monarda fistulosa* (*p*); Onopordon Acanthium (*p*); Panicum virgatum (*g*); Phalaris arundinacea* (*p-g*); Pyrethrum uliginosum (*w* and *y*); Yucca angustifolia (*g-w*); Y. flexilis ensifolia (*r-w*).

5ft. to 6ft.—ANNUALS.—Helianthus annuus (variable); Impatiens amphorata* (*p*, speckled *r*).

BIENNIAL.—Celsia cretica (*y*, spotted *r-br*).

PERENNIALS.—Aconitum barbatum* (*c*); A. chinense (*b*); A. Halleri (*v*); A. japonicum (*p-w*); A. lycoctonum (*v*); A. variegatum* (*b*); Althæa cannabina (*pi*); A. narbonensis* (*pi*); Aster novæ-angliæ (*p*) and vars.; Campanula lactiflora* (*c-b* or *b*); Clematis æthusifolia* (*w*); C. aromatica* (*v-b*); C. Viorna coccinea (*r*, *y* inside); Datisca cannabina* (*y*); Delphinium dasycarpum* (*b*); D. exaltatum* (*b* or *w*); Desmodium canadense (*r-p*); Echinops commutatus (*w*); Epilobium angustifolium* (*r*); Gentiana lutea (*y*); Helenium autumnale (*y*); Lilium croceum* (*r-y*); L. Parryi* (*y*, spotted *b-r*); L. superbum (*o-r*, spotted *r*); Orobus flaccidus (*p*); Pentstemon breviflorus (*y*, or *w-pi*, striped); Silphium laciniatum* (*y*); Solidago speciosa* (*y*); Yucca glauca (*w*).

Flowering Plants—*continued.*

6ft. to 8ft.—ANNUAL.—Althæa rosea (*pi*).

PERENNIALS.—Aconitum uncinatum* (*l*); Actinomeris procera (*y*); Amicia Zygomeris (*y*, splashed *p*); Clematis cærulea (*v*); Lilium pardalinum* (*o-r*, *o*, spotted *p*); L. tigrinum Fortunei (*o-r*, spotted *p-bk*); Polygonum cuspidatum* (*c-w*); Yucca filamentosa glaucescens (*g-w*).

8ft. to 10ft. — ANNUALS. — Impatiens Roylei (*p*); Ipomœa hederacea (*b*); I. purpurea (*p*); Polygonum orientale (*pi-p* or *w*).

PERENNIALS.—Aciphylla Colensoi (*w*); A. squarrosa (*w*); Centaurea babylonica (*y*); Cnicus altissimus* (*p*); Eremurus robustus (peach); Gynerium argenteum* (*si*); Helianthus orgyalis* (*y*); Leucothoë racemosa* (*w*); Lilium giganteum* (*g-w* and *p*); Rudbeckia maxima* (*y*); Sida Napæa* (*w*).

10ft. to 14ft.—ANNUAL.—Solanum crispum (*b-p*).

BIENNIAL.—Michauxia lævigata (*w*).

PERENNIALS.—Arundo conspicua* (*si-w*); A. Donax (*r-w*, turning *w*); Polygonum sachalinense (*g-y*).

FOLIAGE PLANTS.—1in. to 3in.—ANNUAL.—Sedum cœruleum (*g*).

BIENNIAL.—Sedum cœruleum (*g*).

PERENNIALS —Ajuga reptans (*g*); Androsace argentea (*si-gy*); A. carnea (*g*); A. helvetica (*g*); A. Vitaliana (*y*); Diapensia lapponica (*g*); Lomaria pumila (*g*); Nertera depressa (*g*); Pyxidanthera barbulata (*g*); Saxifraga Burseriana (*gl-g*); S. cæsia (*g*, dotted); S. cæspitosa (*g*); S. cortusæfolia (*g*, fading to *r-b*, or *r*); S. Maweana (*g*); S. moschata (*g*); S. pygmæa (*g*); S. retusa (*g*, dotted); Sedum acre aureum (*o-y*); S. anglicum (*g*); S. brevifolium (*g*); S. glaucum (*g-gy*, turning *g-r*); S. kamtschaticum (*g* or *p*).

3in. to 6in.—ANNUALS.—Androsace coronopifolia (*g*); Sedum glandulosum (*g*); S. sempervivoides (*g* and *g-r*).

BIENNIAL.—Sedum sempervivoides (*g* and *g-r*).

PERENNIALS.—Androsace Chamæjasme (*g*); A. lactea (*g*); A. sarmentosa (*si-g*); Artemisia Mutellina (*g-w*); Asplenium Ruta-muraria (*g*); A. septentrionale (*g*); Botrychium Lunaria (*g*); Cerastium alpinum (*si*); Corydalis bracteata (*g*); C. cava (*g*); Cryptogramme crispa (*g*) and var.; Hymenophyllum tunbridgense (*g*); Linaria Cymbalaria (*g*) and var.; Poa trivialis albo-vittata (*g*, margined *w*); Pyrola secunda (*g*); Sarracenia Courtii (*r-p*, veined *p*); S. formosa (*r*, spotted *w*, veined *p*); S. psittacina (*g*, spotted *w*, veined *p*); S. purpurea (*g*, veined *p*); Saxifraga longifolia (*g*); Sempervivum arachnoideum (*g* and *r-b*); S. montanum (*g*); S. Pittoni (*g*, tipped *r-p*); Tussilago Farfara variegata (*g*, blotched *c-w*).

6in. to 12in.—ANNUALS.—Agrostis pulchella (*g*); Amarantus melancholicus ruber (*r-g*); Gymnogramme leptophylla (*g*); Lagurus ovatus (*g*, downy); Mandragora vernalis (*g*).

PERENNIALS.—Aira flexuosa (*g*); Androsace lanuginosa (*g*); Artemisia alpina (*w-g*); Asplenium Ceterach (*g*); A. fontanum (*g*); A. Trichomanes (*g*) and vars.; A. viride (*g*); Astrantia carniolica (*w* and *g*, tipped *r*); Briza media (*g*); B. minor (*g*); Chenopodium Bonus-Henricus (*g*); Disporum lanuginosa (*g*); Hypericum elegans (*g*, dotted *bk*); Kœniga spinosa (*si*); Lomaria alpina (*g*); L. Spicant (*g*); Lycopodium dendroideum (*g*); Nephrodium fragrans (*g*); Sarracenia chelsoni (*r*, veined *p*); Saxifraga sarmentosa tricolor (*g*, *w*, and *r*); Sedum Aizoon (*g*); S. Rhodiola (*gl*); Sempervivum arenarium (*g* and *r-b*); S. atlanticum (*g* and *r-b*); S. Boissieri (*g*); S. Braunii (*g*, tipped *p*); S. calcareum (*g*, tipped *r-br*); S. fimbriatum (*g*, turning *r*); S. Funckii (*g*); S. Heuffelii (*g*); S. Lamottei (*g*, tipped *r-br*); S. Pomelii (*g*); S. soboliferum (*g*, tinged *r-br*); S. Wulfeni (*gl-g*, tipped *r-br*).

Foliage Plants (6in. to 12in.)—*continued.*

1ft. to 1½ft.—ANNUALS. — Agrostis nebulosa (*g*); Amarantus tricolor (*p-r*, *g*, and *y*); Chenopodium ambrosioides (*g*).

PERENNIALS.—Artemisia argentea (*si-g*); A. tanacetifolia (*w-g*); Asplenium marinum (*g*) and vars.; Briza maxima (*g*); Corydalis Semenowii (*gl-g*); Disporum pullum (*g*); Heuchera americana (*g*); H. sanguinea (*g*); Nephrodium decursivo-pinnatum (*g*); Polypodium Dryopteris (*g*); P. Phegopteris (*g*); Sarracenia rubra (*g*, veined *p*); Scorzonera undulata (*g*); Sedum erythrostictum (*g*) and vars.; Sempervivum calcaratum (*g*, tipped *r-br*); Yucca glauca (*gl-g*).

1½ft. to 2ft. — ANNUALS. — Amarantus bicolor (*g*, streaked *y*); A. b. ruber (*r*, *v-r*, *g*); Hordeum jubatum (*g*).

PERENNIALS.—Aletris alchemilla (*g*); A. farinosa (*g*); Artemisia Dracunculus (*g*); Asplenium Michauxii* (*g*); Astrantia major (*g*); Carlina acanthifolia (*g*); Ligularia Kæmpferi aureo-maculata (*g*, blotched *y*, *w*, or *pi*); Meum athamanticum (*g*); Nephrodium erythrosorum (*g*); N. rigidum (*g*); Onychium japonicum (*g*); Sarracenia Drummondii (*w*, veined *p*) and vars.; S. flava (*y*, *r*, veined *p*); Spiræa palmata (*g* and *r*); Stipa pennata (*si*); Xerophyllum asphodeloides (*g*); Yucca angustifolia (*g*); Y. filamentosa glaucescens (*gl*).

2ft. to 3ft. — ANNUALS. — Amarantus salicifolius (*o*, *pi*, and bronze); Perilla ocimoides crispa (bronzy-*p*); Zea Mays (*g*) and vars.

PERENNIALS.—Adiantum pedatum (*g*); Artemisia cana (*si*); Arundo Donax versicolor (*g* and *w*); Adiantum nigrum (*g*) and vars.; Eulalia japonica foliis striatis (*g*, striped *c*); E. j. zebrina (*g*, striped *y*); Juncus lætevirens (*g*); Nephrodium æmulum (*g*); N. Filix-mas (*g*); N. floridanum (*g*); N. molle cristata (*g*); Osmunda Claytoniana (*g*); Rheum nobile (*g*, nerved *r*); Scorzonera hispanica (*g*); Sedum maximum hæmatodes (*g-p*); Yucca flexilis ensifolia (*gl-g*).

3ft. to 4ft — PERENNIALS. — Artemisia Abrotanum (*g*); A. vulgaris (*g* and *w*. or *g* and *o*); Asplenium Filix-fœmina* (*g*) and vars.; Gunnera scabra (*g*); Heuchera hispida (*g*); Nephrodium Goldieanum (*g*); Osmunda cinnamomea (*g*).

4ft. to 5ft.—ANNUALS.—Amarantus speciosus (*r-g*); Ricinus communis (*g*) and var.

PERENNIAL.—Ferula asparagifolia (*g*).

5ft. to 6ft. — PERENNIALS. — Arundinaria falcata* (*g*); Gunnera manicata (*g*); Gynerium argenteum (*gl-g*).

6ft. to 8ft. — PERENNIALS. — Ferula glauca (*gl-g*); F. tingitana (*g*); Osmunda regalis* (*g*).

9ft. to 15ft.—BIENNIAL.—Adlumia cirrhosa (*g*).

PERENNIALS —Arundo conspicua* (*g*); A. Donax (*gl-g*); Cornus mas (*g*) and var.; Eryngium pandanifolium (*g*); Ferula communis (*g*); Rheum officinale* (*g*); Smilax aspera (*g*, spotted *w*).

AN INDEX TO FERNS AND LYCOPODS.

THE object of this section of the Supplement is to present to the gardener, at a glance, a list of the most desirable Ferns and Lycopods for culture either in or out of doors. The combined lengths of the stipes and fronds are shown in feet and fractions of a foot. It is impossible to give accurately the heights of some of the Tree-ferns, the length of the caudex so much depending on the age of the plant, and the circumstances under which it is grown.

HARDY. — Adiantum pedatum (1¼-3); Aspidium acrostichoides (1½-2½) and vars.; A. aculeatum (1½-4); A. Lonchitis (1-2½); A. munitum (1¼-2¾); Asplenium Ceterach (½-¾) and vars.; A. crenatum (1¼-2¼); A. Filix-fœmina (1½-4) and vars.; A. fontanum (½-¾); A. germanicum (¼-½); A. Goringianum pictum (½-1½); A. lanceolatum (¾-1) and vars.; A. marinum (¾-2) and vars.; A. Ruta-muraria (¼-½); A. septentrionale (¼-½); A. Trichomanes (½-1¼) and vars.; A. viride (½-¾); Botrychium Lunaria (¼-½); B. virginianum (½-2½); Cheilanthes Clevelandi (½-1); C. lanuginosa (½-1); Cryptogramme crispa and vars.; Gymnogramme leptophylla (¼-¾); Hymenophyllum tunbridgense (⅛ to ½); Lomaria Spicant (¼-1); Lycopodium dendroideum (½-¾); Nephrodium æmulum (2-3½); N. decursivo-pinnatum (1¼-1¾); N. erythrosorum (1½-1¾); N. Filix-mas (2½-3½) and vars.; N. floridanum (2-2¾); N. fragrans (½-¾); N. Goldieanum (3-4); N. rigidum (1½-2); N. spinosum (2-2½) and vars.; Onoclea germanica; O. sensibilis; Osmunda cinnamomea (2-3); O. Claytoniana (2-3); O. regalis (3-7½) and vars.; Polypodium Dryopteris (1-2); P. Phegopteris (1-1½); P. vulgare (¾-1½) and vars.; Pteris aquilina (3-5); Trichomanes radicans (½-1½).

HALF-HARDY.—Adiantum venustum (1-1¾); Cheilanthes fragrans (¼-½); C. vestita (½-1); Lomaria alpina (¼-¾); L. pumila (½-¾); Onychium japonicum (1½-2½); Ophioglossum bulbosum (⅛-⅓).

COOL-HOUSE.—Acrostichum Blumeanum (1½-3); A. muscosum (¾-1½); A. squamosum (½-1½); A. subdiaphanum (½-1); Adiantum affine (¾-1¼); A. bellum (¼-½); A. Capillus-Veneris (¼-¾) and vars.; A. colpodes (1-2); A. cuneatum (1¼-2½) and vars.; A. decorum (1-1¾); A. diaphanum (¾-1¾); A. formosum (2½-3½); A. fulvum (1½-2½); A. glaucophyllum (1½-2¼); A. gracillimum (1¼-2¾); A. hispidulum; A. Luddemannianum (¼-¾); A. monochlamys (1-1¾); A. reniforme (½-¾); A. rubellum (¾-1); A. venustum (1-1¾); A. Williamsii (1¼-2); Allantodia Brunoniana (1-2); Anemia Phyllitidis (¾-1¾); A. tomentosa (1-2); Aspidium aristatum (1¾-2½) and vars.; A. capense (2-5); A. falcinellum (1-2); A. fœniculaceum (1½-3); A. lasercpitiifolium (1-2); A. varium (1½-2½); Asplenium acuminatum (1½-2¾); A. angustifolium (2½-3); A. dentatum (½-¾); A. ebeneum (1¼-2); A. falcatum (1-2½); A. fissum (¼-1); A. flabellifolium (½-¾); A. furcatum (¾-2); A. Goringianum pictum (½-1½); A. Hemionitis (¾-1¼) and vars.; A. lasercpitiifolium (1½-5); A. monanthemum (1¼-2); A. montanum (¼-½); A. nitidum (3-4); A. novæ-caledoniæ (1¼-2); A. obtusatum lucidum (¾-2½); A. oxyphyllum (1½-3); A. Petrarchæ (¼-½); A. planicaule (¾-1½); A. resectum (¾-2); A. rhizophyllum (¾-1½) and vars.; A. rutæfolium (¾-2); A. Sandersoni (½-1); A. Selosii (⅛-¼); A. spinulosum (1¼-2); A. Viellardii (¾-1¼); Botrychium ternatum (¼-½); Cheilanthes argentea (½-¾); C. capensis (¾-1); C. Eatoni (½-1¼); C. Fendleri (½-¾); C. gracillima (½-¾); C. Lindheimeri (½-1); C. Sieberi (½-1); C. tomentosa (¾-1½); C. Wrightii (¼-½); Davallia affinis (1¼-2¾); D. canariensis (1¼-2); D. dissecta (1½-2); D. elegans (1¼-2½); D. fijensis (1½-2¼); D. hirta (4-8); D. pallida (3-4½); D. pentaphylla (½-¾); D. platyphylla (3-7); D. pyxidata (1-2); D. repens (¾-1½); D. solida (1¼-2½); D. tenuifolia (1½-2½); D. Tyermanni (½-¾); Doodia aspera (¾-1¼); D. media (1¼-2); Fadyenia prolifera (½-¾); Gleichenia rupestris (2-6); Hymenophyllum demissum (½-1½); H. pulcherrimum (¾-1½); Hypolepis distans (1¼-1¾); Lomaria Banksii (¾-1); L. blechnoides (½-1); L. Boreana (1-1½); L. discolor (1-3); L. Fraseri (1-2); L. nigra (½-¾); L. procera (1½-4); Lygodium japonicum; Mohria caffrorum (¾-1¾); Nephrodium catopteron (7-10); N. cyatheoides (3-5); N. decompositum (2-3½); N. hispidum (2-3); N. inæquale (2-3); N. Richardsi (1¼-1½); N. Sieboldii (1-2); Nephrolepis pluma (4-5); Nothochlæna Eckloniana (¾-1½); N. hypoleuca (½-¾); N. lanuginosa (½-¾); N. Marantæ (½-1½); N. nivea (½-1); Onychium japonicum (1½-2¼); Osmunda javanica (1½-4); Pellæa andromedæfolia (1-1¾); P. atropurpurea (½-1½); P. brachyptera (¾-1); P. Bridgesii (½-¾); P. falcata (¾-2); P. hastata (1-3); P. ornithopus (½-1); P. rotundifolia (1-2); Platycerium alcicorne (2-3); Polypodium drepanum (2½-4½); P. pustulatum (¼-1); Pteris arguta (2-4); P. cretica (1-2); P. scaberula (1½-2½); P. serrulata (1¼-2¼); P. tremula (3-5); P. umbrosa

Cool-house—*continued.*

(2-3½); Schizæa bifida (½-1½); S. rupestris (¼-½); Selaginella albo-nitens; S. apus; S. denticulata; S. Kraussiana; S. lepidophylla; S. Martensii; S. Poulteri; S. uncinata; Todea hymenophylloides (1½-3); Trichomanes alatum (½-1¼); T. Bancroftii (¼-¾); T. Kraussii (¼); T. maximum (1½-2); T. pyxidiferum (¼-¾); T. rigidum (¼-1¼); T. trichoideum (½-¾); Woodsia mollis; W. obtusa (¾-1¼); W. polystichoides (1-1¼); Woodwardia areolata (¾-1); W. Harlandii (¾-1¾); W. radicans (3-6) and vars.

STOVE.—Acrostichum acuminatum (1¼-2½); A. apiifolium (½-¾); A. apodum (1); A. appendiculatum (¾-2); A. aureum (3-8); A. auritum (1-1¾); A. canaliculatum (3-4); A. cervinum (3-5); A. conforme (½-1); A. crinitum (1-2¼); A. fœniculaceum (¼-¾); A. Herminieri (1½-3); A. latifolium (1¼-2½); A. lepidotum (¼-¾); A. nicotianæfolium (2½-5); A. osmundaceum (2-3½); A. peltatum (¼-½); A. quercifolium (¼-½); A. scolopendrifolium (1¼-2); A. scandens (1¼-3¼); A. sorbifolium (1½-2½); A. squamosum (¾-1⅓); A. subrepandum (1-2); A. taccæfolium (1-2¼); A. tenuifolium (3¼-5½); A. villosum (¾-1); A. viscosum (¾-1½); Actiniopteris radiata (¼-½); Adiantum æmulum (½); A. æthiopicum (1½-2¼); A. ancitense (1½-2); A. Bausei (1½-2); A. caudatum (¾-1¼); A. concinnum (1¼-2¼); A. crenatum (1-1½); A. cubense (¾-1¾); A. curvatum (1-2); A. digitatum (2-4½); A. Edgworthii (¾-1¼); A. excisum (¾-1¾); A. Feei (2-3½); A. flabellulatum (¼-¾); A. Ghiesbreghti (1½-2½); A. Henslovianum (1½-2½); A. Lathomi (1½-2); A. Lindeni; A. lucidum (1¼-2); A. lunulatum (¾-1½); A. macrophyllum (1½-2¼); A. Moorei (1-2); A. neoguineense (½-¾); A. palmatum (3-3½); A. peruvianum (¾-1½); A. polyphyllum (3-4½); A. princeps (2¼-3); A. pulverulentum (¾-1½); A. Seemanni (1¼-1½); A. tenerum (2-4) and vars.; A. tetraphyllum (1-1⅝); A. tinctum (1-1⅝); A. trapeziforme (1½-3) and vars.; A. Veitchianum (1¼-2¼); A. velutinum (3-4); A. villosum (1¼-2); Anemia adiantifolia (1½-2¼); A. Dregeana (1¼-2); A. mandioccana (1½-2); Antrophyum lanceolatum (1-1½); Aspidium auriculatum (1½-2) and vars.; A. falcatum (1½-3); A. mucronatum (1-2); A. triangulum (1-1½); Asplenium alatum (1¼-2); A. auriculatum (1¼-2); A. Baptistii (1½-1¾); A. Belangeri (1¼-2); A. bisectum (1¼-2); A. cicutarium (¾-1¾); A. cultrifolium (¾-1¾); A. dimidiatum (1-2¼); A. dimorphum (2½-4); A. esculentum (5-8); A. fejeense (2-2½); A. fragrans (¾-1½); A. Franconis (2-3); A. heterocarpum (¾-1¼); A. longissimum (2¼-9); A. lunulatum (¾-1⅝); A. melanocaulon (3-5); A. Nidus (2-4) and vars.; A. obtusifolium (1½-2¼); A. obtusilobum (½-¾); A. paleaceum (½-1); A. pulchellum (¼-¾); A. rhizophorum (1½-2½); A. Shepherdi (2-2½); A. Thwaitesii (1¼-1⅝); A. trilobum (¼-½); A. vittæforme (1-1½); A. viviparum (1½-2¼); A. zeylanicum (¾-1¾); Ceratopteris thalictroides; Cheilanthes farinosa (½-1½); C. lendigera (½-2); C. microphylla; C. mysurensis (¼-1); C. radiata (1-1½); C. rufa (½-1); C. viscosa (¾-1); Deparia con-

Stove—*continued.*

cinna (1-1½); D. prolifera (½-¾); Gleichenia circinata (1½-2) and vars.; G. dicarpa (1¾-2); G. dichotoma (¾-1); G. flagellaris (½-1); G. longissima (¾-2); G. pectinata (2½-3); G. pubescens (2½-3); Gymnogramme calomelanos (1½-4); G. decomposita (2-2½); G. javanica (2-8); G. lanceolata (½-1); G. Lathamiæ (2-2½); G. macrophylla (1-1½); G. Pearcei (1½-1⅝); G. schizophylla (1½-2); G. sulphurea (½-1½); G. tartarea (1½-3); G. triangularis (¾-1¼); Hymenophyllum æruginosum (¼-½); H. ciliatum (¼-¾); H. hirsutum (¼-¾); H. polyanthos (¼-1); Hypolepis Bergiana (3-4½); Lindsaya adiantoides (¼-⅜); L. cultrata (¾-1½); L. guianensis (1½-3); L. reniformis (½-1); L. stricta (2-4); L. trapeziformis (1-2¼); Lomaria attenuata (1½-3); Lycopodium Phlegmaria (2-2½); L. taxifolium (¾-1); Lygodium dichotomum (½-1¼); L. palmatum; L. reticulatum; L. scandens; L. venustum; L. volubile; Nephrodium Arbuscula (1¼-2¼); N. circutarium (2-3); N. cuspidatum (3-4½); N. detoideum (1¼-2½); N. glandulosum (2-3); N. Leuzeanum (6-9); N. molle (2-3) and vars.; N. patens (3-4); N. pteroides (3-6); N. venustum (3-3½); N. vestitum (1½-3); N. villosum (6-9); Nephrolepis cordifolia (1-2); N. davallioides (3-4); N. Duffii (2½-3); Oleandra articulata (½-1¼); O. neriiformis (½-1½); O. nodosa (¾-1½); Onychium auratum (1½-2¼); Platycerium grande (4-6); P. Hillii (1¼-1½); P. Wallichii; P. Willinckii; Polypodium albo-squamatum (1½-3); P. aureum (4-7); P. crassifolium (1¼-3½); P. fraternum (1¼-2); P. Heracleum (3-6); P. juglandifolium (2½-3½); P. Lingua (½-1¼); P. pectinatum (1¼-3½); P. piloselloides (¼); P. plesiosorum (¾-1¼); P. quercifolium (2¼-4); P. rupestre (¾-1¼); P. trichomanoides (¼-½); P. vacciniifolium (¼); P. verrucosum (4½-6); Pteris aspericaulis (1½-1⅝); P. elegans (1½-2); P. flabellata (2-4); P. heterophylla (½-1); P. leptophylla (1¼-1⅝); P. longifolia (1½-3); P. palmata (1¼-1⅝); P. patens (4-5); P. pedata (¼-½); P. quadriaurita (1½-5); P. sagittifolia (¾-1); Selaginella atroviridis; S. canaliculata; S. caulescens; S. cuspidata; S. erythropus; S. grandis; S. hæmatodes; S. lævigata; S. Wallichii; S. Willdenovii.

TREE FERNS.

COOL-HOUSE.—Alsophila australis; A. Cooperi; A. excelsa (30-40); A. Leichardtiana (16-30); A. Rebeccæ (8-16); A. Scottiana; Cyathea Cunninghami (13-17); C. dealbata; C. excelsa; Dicksonia antarctica (35-45); D. Berteroana (7-16); D. regalis (1½-2); D. squarrosa (1¼-2¼); Hemitelia Smithii; Todea barbara (4-5); T. superba (3-6).

STOVE.—Alsophila aculeata; A. armata; A. aspera (10-30); A. contaminans (20-50); A. paleolata (11-22); A. pruinata; A. sagittifolia; A. Tænitis; A. villosa (13-21); Asplenium radicans; Cyathea arborea; C. insignis; C. integra; C. medullaris; C. Serra; Dicksonia chrysotricha (1-1½); D. fibrosa (3-4); D. Menziesii (3-4); D. Sellowiana (6-8); Didymochlæna lunulata; Hemitelia grandifolia; H. speciosa; Lomaria ciliata; L. gibba.

AN INDEX TO BULBOUS PLANTS.

THE term "Bulb" has a very wide horticultural significance, and is by no means restricted to the description of Bulbous Plants properly so-called. Colchicums, Crocuses, and Gladioli are corms, most of the Irises are rhizomatous, and the roots of the garden Ranunculus are tuberous: yet all are familiarly known and purchased as "Bulbs."

Most of the plants named in nurserymen's Bulb catalogues are here classified according to hardiness, or the protection required for their successful culture. Orchids are not included, but are treated separately further on in the Supplement.

After each name is given abbreviated information as to the colours of the flowers, and the height of the plant in feet and the fractions of a foot. Where plants are grown for their foliage, *e.g.*, Caladiums and other Aroids, the contractions following *fol* refer to the colours and markings of the leaves.

For information as to selection and general treatment, the reader is referred to the article on "Bulbs," in Vol. I.

The following abbreviations are used:

b, blue; *bk*, black; *c*, cream; *fol*, foliage; *g*, green; *gy*, grey; *l*, lilac; *m*, magenta; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *s-aq*, semi-aquatic; *si*, silvery; *v*, violet; *w*, white; *y*, yellow.

HARDY.—Aconitum album (*w*; 4-5); A. angustifolium (*b*; 2-3); A. biflorum (*b*; ½); A. delphinifolium (*b-p*; ½-2); A. eminens (*b*; 2-4); A. gracile (*b* or *v*; 2); A. Halleri (*v*; 4-6); A. H. bicolor (*w*, variegated *b*; 4-6); A. japonicum (*w-pi*; 3); A. lycoctonum (*v*; 4-6); A. Napellus (*b*; 3-4) and vars.; A. Ottonianum (*b*, variegated *w*; 2-4); A. paniculatum (*v*; 2-3); A. rostratum (*v*; 1-2); A. tauricum (*b*; 3-4); A. uncinatum (*l*; 4-8); A. variegatum (*b*; 1-6) and vars.; A. Willdenovii (*b-p*; 1-3); Allium acuminatum (*pi*; ½-¾); A. azureum (*b*; 1-2); A. Bidwelliæ (*pi*; ¼); A. Breweri (*pi*; ¼); A. cœruleum (*b*; ¾); A. falcifolium (*pi*; ¼); A. Macnabianum (*m*; 1); A. Moly (*y*; ¾-1¼); A. Neapolitanum (*w*; 1¼-1½); A. nigrum (*v* or *w*; 2½-3¼); A. pedemontanum (*pi-p*); A. reticulatum attenuifolium (*w*; ¾-1¼); A. roseum (*l-pi*; 1-1½); A. sphærocephalum (1½-2½); Alströmeria aurantiaca (*o*, streaked *r*; 3-4); A. chilensis (*pi-w*, varying to *o* or *r*; 2-3); A. psittacina (*r*, *g*, and *p*; 6); Ampelopsis napiformis (*g*); A. serjaniæfolia; Anemone apennina (*b*; ½); A. baldensis (*w*; ½); A. coronaria (variable; ½); A. nemorosa (*w*; ½) and

Hardy—*continued.*

vars.; A. palmata (*y*; ¾) and vars.; A. ranunculoides (*y* or *p*; ½); A. stellata (*p* or *pi-r*; ¾); Anthericum Liliago (*w*); A. Liliastrum (*w*, *sc*; 1-2); A. ramosum (*w*; 2); Arisæma Griffithi (*br-v*; 1-1½); A. ringens (*g*, *w*, and *p*); A. triphylla (*p-br* and *g*; ¾-1); Arum italicum (*g-y* or *w*; ¾-2) and var.; A. proboscideum (*g-p*; ½); A. tenuifolium (*w*; 1); Asclepias tuberosa (*o*; 1-2); Asphodelus albus (*w*; 2); A. creticus (*y*; 2); Bellevalia syriaca (*w*; 1); Biarum tenuifolium (*br-p*; ½); Brodiæa capitata (*v-b*; 1-2); B. congesta (*b*; 1); B. c. alba (*w*; 1); B. grandiflora (*b-p*; 1½); B. Howellii (*p-b*; 1½-2); B. lactea (*w*, midribs *g*; 1-2); B. multiflora (*b-p*; 1-1½); Bulbocodium vernum (*v-p*, spotted *w*; ½); Calliprora lutea (*p-br*; ¾); Camassia esculenta (*b*; 1½); C. e. Leichtlini (*c*; 2); C. Fraseri (*b*; 1); Chionodoxa Luciliæ (*b*, *w* centre; ½); C. nana (*w* and *l*; ¼); Chlorogalum pomeridianum (*w*, veined *p*; 2); Chrysobactron Hookeri (*y*; 1½-3); Claytonia virginica (*w*; ¼); Colchicum autumnale (*p*; ¼) and vars.; C. Bivonæ (*w* and *p*); C. luteum (*y*; ¼); C. Parkinsoni (*w* and *p*);

Hardy—*continued.*

C. speciosum (*r-p* and *w*); Convallaria majalis (*w*, *sc*; ½-1) and vars.; Crinum capense (flushed *r*; 1); Crocus aureus (*o*) and vars.; C. biflorus (*w*, varying to lavender); C. Boryi (*c*, throat *o-y*; ¼); C. Imperati (*l-p* and *p*, *sc*; ¼-½); C. iridiflorus (*p* and *l*); C. nudiflorus (*p* or *v*); C. speciosus (*l*, striped *p*); C. susianus (*o*, or *br* and *o*; ¼); C. vernus (*l*, *v*, *w*, or *w* and *v*); C. versicolor (*p*, varying to *w*); C. varieties; Dicentra spectabilis (*pi-r*; ¾-2) and var.; Dioscorea Batatas (*w*; 6-9); Dracunculus vulgaris (*b*; 3); Eranthis hyemalis (*y*; ¼-¾); E. sibiricus (*y*; ¼); Eremurus himalaicus (*w*; 1½-2); E. robustus (peach; 8-9); E. spectabilis (*y*; 2); Erythronium americanum (*y*; ¼-½); E. dens-canis (*p-pi* or *w*; ½) and vars.; Fritillaria armena (*y*; ½); F. delphinensis (*p*, spotted *y*; ½-1); F. græca (*br*, spotted, &c.; ½); F. Hookeri (*l*; ½); F. imperialis (*y*, varying to *r*; 3); F. lutea (*y*, suffused *p*; ½-1); F. macrophylla (*pi*; 3); F. Meleagris (chequered *p*; 1); F. pallidiflora (*y*; ¾); F. persica (*v-b*; 3); F. pudica (*y*; ½-¾); F. pyrenaica (*p*; 1½); F. recurva (*r*; 2); F. Sewerzowi (*p*, *g-y* within; 1½); F. tenella (*y*, chequered *p-br*); F. tulipifolia (*b*, streaked *p-br*, *p-br* within); F. verticillata Thunbergii (*g*, mottled *p*); Funkia grandiflora (*w*, *sc*; 2); F. ovata (*b-l* or *w*; 1-1½); F. marginata (*b-l* or *w*, *fol* margined *w*; 1½); F. Sieboldiana (*w*, tinged *l*; 1); F. subcordata (*w*; 1½-2); Gagea lutea (*y*, *g* at back; ½); Galanthus Elwesii (*w*, spotted *g*; ½-1); G. nivalis (*w*, marked *g*; ¼-½) and vars.; G. plicatus (*g-w*; ½); Galtonia candicans (*w*, *sc*; 4); Gladiolus byzantinus (*r*; 2); G. segetum (*pi*; 2); Helicodiceros crinitus (*p-br*; 1-1½); Hemerocallis Dumortieri (*o-y*, tinged *br*; 1-1½); H. fulva (fulvous; 2-4) and vars.; Iris alata (*l-p*; 1); I. aurea (*y*; 3-4); I. balkana (*l-p*; 1); I. biflora (*v-p*; 1½); I. Chamæiris (*y*, veined *br*; ½); I. cretensis (*l*); I. cristata (*l*; ½); I. Douglasiana (*l-p*; ½-1); I. filifolia (*p*, keeled *y*; 1-2); I. flavescens (*y*; 2-3); I. florentina (*w*, *l*, *g*, and *br*; 2-3); I. fœtidissima (*b-l*; 2-3); I. fulva (*br*; 2-3); I. germanica (variable, *sc*; 2-3); I. graminea (*l-p*, *w*, *y*, and *b-p*, *sc*; ¾); I. Guldenstadtiana (*w*, *o*, and *y*; 2); I. Histrio (*l*, *l-p*, and *y*; 1); I. hybrida (variable); I. iberica (*p-b*, blotched *p*); I. i. insignis (*w* and *l-w*, blotched and veined *r-br*); I. lævigata (*p*, blotched *y*, &c.; 1½-2); I. lutescens (*y*, marked *p-br*); I. Monnieri (*y*, *sc*; 3-4); I. neglecta (*l*, *w*, and *y*; 1½-2); I. ochroleuca (*w* and *o-y*; 3); I. persica (*y-l*, keeled *y*, *sc*; ½); I. Pseudo-acorus (*s-aq*, *y*; 2-3); I. pumila (*l-p*; ½); I. reticulata (*v-p*, lined *y*; 1); I. rubromarginata (*g*, tinged *p*; ½); I. ruthenica (*l-p*, *sc*); I. sambucina (*p* and *y*, *sc*; 2); I. sibirica (*l-b* and *v*; 1-2½); I. squalens (*l-p*, *y*, and *br-y*; 2-3); I. tectorum (*l* and *w*; 1); I. tingitana (*l-p*; 2-3); I. tuberosa (*g-y*; 1); I. unguicularis (*l*, *y*, and *w*, *sc*); I. variegata (*br* and *y*; 1-1½); I. versicolor (*p*; 1-2); I. vulgare (*p*; 1-2); I. xiphioides (*l-p*, *y*, and *p*; 1-2); Kniphofia aloides (*r*, fading to *g-y*; 3-4); K. a. maxima; K. Burchelli (*r* and *y*, tipped *g*; 1½); K. Leichtlinii (*r* and *y*); K. Rooperi (*o-r*, turning *y*; 2); Leucoium æstivum (*w*; 1½); L. Hernandezii (*w*; 1-1½); L. vernum (*w*, spotted *g*, *sc*; ½); Lilium auratum (*w*, banded *y*, spotted *p*; 2-4) and vars.; L. bulbiferum (*r*; 2-4); L. canadense (*y*, varying to *r*, spotted *r-p*; 1½-3); L candidum (*w*, rarely tinged *p*; 2-3); L. Catesbæi (*o-r*, spotted *p*; 1-2); L. chalcedonicum (*r*, rarely *y*; 2-3); L. concolor Buschianum (*r*, spotted *bk* below); L. croceum (*y*, tinted *r*; 3-6); L. davuricum (*r*; 2-3) and vars.; L. elegans (*r*, rarely spotted; 3); L. e. armeniacum (*r*, spotted *y*; 1); L. e. atrosanguineum (blotched *r*; 2); L. e. sanguineum (*r* and *y*; 1-1½); L. Hansoni (*r-o*, dotted *p*; 3-4); L. Krameri (*w*, tinged *r*, *sc*; 3-4); L. Leichtlinii (*y*, marked *p* and *r*; 2-3); L. longiflorum (*w*, *sc*; 1-2); L. l. eximium (*w*; 1-2); L. Martagon (*p-r*, spotted *p*; 2-3); L. monadelphum (*y*, tinged *r* at base; 3-5) and var.; L. oxypetalum (*l-p*, dotted *p* within; 1-1½); L. pardalinum (variable; 3-7); L. Parryi (*y*, spotted *br-r*, *sc*; 2-6); L. philadelphicum (*o-r*, spotted *p* below; 1-3); L. pomponium (*r*; 1½-3); L. pseudo-tigrinum (*r*, spotted *bk* within; 3-4); L. pyrenaicum

Hardy—*continued.*

(*y*; 2-4); L. roseum (*l*; 1½); L. speciosum (*w*, or spotted *r*; 1-3); L. s. albiflorum (*w*); L. s. punctatum (*w*, spotted *r*); L. s. roseum (*w*, tinted *pi*); L. superbum (*o r*, spotted; 4-6); L. tenuifolium (*r*; ½-1); L. tigrinum (*o-r*, spotted *p-bk*; 2-4) and vars.; L. Washingtonianum (*w*, tinged *p* or *l*; 3-5); Merendera Bulbocodium (*pi-l*; ¼); Milla biflora (*w*, *g* outside; ½); Muscari botryoides (*b*, *w* teeth; ½-1) and vars.; M. comosum monstrosum (*b-v*; 1-1½); M. Elwesii (*b*; ¼-½); M. Heldreichii (*b*; ¾); M. moschatum (*p*, changing to *g-y*, tinged *v*, *sc*; ¾); M. neglectum (*b*, *sc*; ½-¾); M. paradoxum (*b-bk*, *g* inside; *sc*; ¾); M. racemosum (*b*, changing to *r-p*, sometimes tipped *w*, *sc*; ¼-¾); M. Szovitsianum (*b*, *sc*; ½); Narcissus biflorus (*w*, crown *y*; 1); N. Bulbocodium (*y*; ¼-¾) and vars.; N. calathinus (*y*; ¾-1); N. incomparabilis (*y*; 1) and vars.; N. Jonquilla (*y*, *sc*; ¾-1); N. Macleai (*w* and *y*; 1); N. poeticus (*w*, crown edged *r*, *sc*; 1) and vars.; N. Pseudo-Narcissus (*y*; 1) and vars.; N. Tazetta (*w* and *y*, &c., *sc*; 1) and vars.; N. triandrus (*w* or *y*, &c.; ½-1) and vars.; Nothoscordum fragrans (*w*, barred *l*, *sc*; 1¼-2); Ornithogalum narbonense (*w*, striped *g*; 1-1½); O. nutans (*w* and *g*; ¾-1); O. pyramidale (*w*, striped *g*; 1½-2); O umbellatum (*w* and *g*; ½-1); Oxalis tetraphylla (*r* or *p-v*); Pæonia albiflora (*w*, *pi*, &c.; 2-3) and vars.; P. Emodi (*w*; 2-3); P. officinalis (*r*; 2-3); P. tenuifolia (*r*; 1-1½); P. Wittmanniana (*y-w*; 2); P. varieties; Pancratium illyricum (*w*, *sc*; 1½); Puschkinia scilloides (*w*, striped *b*; ½); Ranunculus asiaticus vars.; Sanguinaria canadensis (*w*; ½); Saxifraga peltata (*w* or *w-pi*); Scilla amœna (*b* or *w*; ½); S. bifolia (*b*, *r*, or *w*; ¼-½); S. hispanica (*b*, *w*, &c.; ½-¾) and vars.; S. hyacinthoides (*b-l*; 1-2); S. nutans (*b*, *p*, *w*, or *pi*; 1); S. peruviana (*l*, *r*, or *w*; ½-1); S. pratensis (*b*; ½-1); S. sibirica (*b*; ¼-½); Spiræa astilboides (*w*); S. Filipendula (*w* or *pi*; 2-3); S. palmata (*r*; 1-2); S. p. alba (*w*; 1-2); Sternbergia lutea (*y*; ¼-½) and vars.; Thalictrum tuberosum (*w*; 1); Trillium erectum (*p*; 1); T. erythrocarpum (*w*, striped *p*; 1); T. grandiflorum (*w*, turning *pi*; 1-1½); T. nivale (*w*; 2-4); Triteleia laxa (*b*; 1-1½); T. uniflora (*l*; ½-1); Tritonia Pottsii (*y*, flushed *r*; 3-4); Tropæolum polyphyllum (*y*); Tulipa australis (flushed *r*); T. Clusiana (*w*, *r*, and *bk*; 1-1½); T. Eichleri (*r*, marked *y* and *bk*); T. elegans (*r*, *y* eye); T. Gesneriana (*r*, *y*, &c.; 2) and vars.; T. Greigi (*r*, blotched *bk*; ¾); T. macrospeila (*r*, blotched *bk* and *y*; 2); T. Oculus-solis (*r*, blotched *bk*; 1-1½); T. præcox (*r*, blotched *bk*; 1); T. pubescens (*r*, &c., *sc.*) and vars.; T. retroflexa (*y*); T. suaveolens (*r* and *y*, *sc*; ½); T. sylvestris (*y*, *sc*; 1-2); T. varieties; Uvularia grandiflora (*y*; 1); U. sessilifolia (*y*; 1); Xerophyllum asphodeloides (*w*; 1-2); Zephyranthes Atamasco (*w*; 1).

HALF-HARDY.—Amaryllis Belladonna (variable); A. B. pallida (2); Apios tuberosa (*br-p*, *sc*); Babiana disticha (*b*, *sc*; ½); B. plicata (*v-b*, *sc*; ½); B. ringens (*r*; ½); B. stricta (*w* and *l-b*; 1); B. s. rubro-cyanea (*b* and *r*; ½-¾); B. s. sulphurea (*c* or *y*; ¾); B. s. villosa (*r*; ½); Bessera elegans (*r*, or *r* and *w*; 2); Boussingaultia baselloides (*w*, turning *bk*, *sc*); Bravoa geminiflora (*o-r*; 2); Brodiæa coccinea (*r*; 1½); B. gracilis (*y*; ¼); Calioscordum nerinæflorum (*pi*; ½); Chlidanthus fragrans (*y*, *sc*); Crocosmia aurea (*o-r*; 2); Cypella Herberti (*y*; 1); Dahlia varieties (*w*, *y*, *r*, &c.); Eucomis bicolor (*g*, edged *p*); E. nana (*br*; ¾); Ferraria Ferrariola (*g-br*; ½); F. undulata (*g-br*; ½); Gladiolus blandus (*w* and *y*, marked *r*; ½-2); G. brachyandrus (*r*; 2); G. cardinalis (*r*, spotted *w*; 3-4); G. Colvillei (*r*, marked *p*; 1½); G. C. alba (*w*; 1½); G. cruentus (*r* and *y-w*; 2-3); G. cuspidatus (*p* and *r*, &c.; 2-3); G. floribundus (*w*, *p*, *r*, &c.; 1); G. Papilio (*p* and *y*; 2-3); G. psittacinus (*r*, *p*, *y*, and *g*; 3); G. purpureo-auratus (*y*, blotched *p*; 3-4); G. varieties; Herbertia cærulea (*b* and *w*; ½); Hyacinthus varieties (*sc*); Ixiolirion tataricum (*b*; 1-1½); Lilium cordifolium (*y*, *w*, *p*; 3-4); L. japonicum (*w*, tinged *p*; 1-2); Moræa edulis (*v*, spotted *y*; 4); M. tricuspis (*g-w*, spotted *p*; 1); M. unguicularis (*w*, spotted *p-r*;

Half-hardy—*continued.*

1); Nemastylis acuta (*b, y,* and *bk*); Pancratium montanum (*w, sc*; 2); Schizostylis coccinea (*r*; 3); Scilla chinensis (*pi-p*; 1); Tigridia pavonia (*o-y*; 1-2); Tricyrtis hirta (*w,* dotted *p*; 1-3); T. macropoda (*w-p,* dotted *p*; 2-3); Triteleia porrifolia (*w-v*; ½-¾); Tropæolum tricolorum (*o-r, o,* and *bk*); Urginea maritima (*w,* keeled *g-p*; 1-3); Wachendorfia thyrsiflora (*y*; 2); Zephyranthes carinata (*g* and *pi*; 1); Z. rosea (*pi*; ½).

TENDER.—Achimenes grandiflora (*i-h, v-p*; 1½); A. Kleei (*i-h, l,* throat *y*; ½); A. multiflora (*i-h, l*; 1); A. ocellata (*i-h, y,* spotted; 1½); A. pedunculata (*i-h, r, y* eye; 2); A. picta (*i-h, r, y* eye; 1½); A varieties (*i-h*); Agapanthus umbellatus (*c-h, b*; 2-3); A. u. varieties (*c-h, b* or *w*; 2-3); Albuca aurea (*c-h, y*; 2); A. fastigiata (*c-h, w*; 1½); A. Nelsoni (*c-h, w,* striped *r*; 4-5); Alocasia chelsoni (*st, fol g, p* beneath); A. cuprea (*st, p-r*; 2); A. hybrida (*st*); A. Jenningsii (*st, fol g* and *br*); A. Johnstoni (*st, fol g* and *pi-r*); A. scabriuscula (*st, w*; 4-4½); A. Sedeni (*st, fol* veined *w*); A. Thibautiana (*st, fol gy-g, p* beneath); A. zebrina (*st*; 4); Alströmeria caryophyllæa (*st, r, sc*; ¾-1); A. densiflora (*c-h, r,* dotted *bk*); A. Pelegrina (*c-h, w* or *y,* striped *pi*; 1); A. P. alba (*c-h, w*); A. pulchra (*c-h, p, y,* and *r*; 1); A. Simsii (*c-h, y,* streaked *r*; 3); A. versicolor (*c-h, y* and *p*; 2-4); Amorphophallus campanulatus (*st, br, r,* and *bk*; 2); A. Lacourii (*c-h*); A. Rivieri (*st, g, pi,* and *r*); A. Titanum (*st, bk-p*); Anchomanes Hookeri (*st, p*); Anomatheca cruenta (*c-h, r*; ½-1); Antholyza æthiopica (*c-h, r* and *g*; 3); A. caffra (*c-h, r*; 2); A. Cunonia (*c-h, r* and *bk*; 2); Arisæma concinna (*c-h, w, g,* and *b-p*; 1-2); A. curvatum (*c-h, g* and *w*; 4); A. galeata (*c-h, g* and *p*; 1); A. nepenthoides (*c-h, y, br,* and *g*; 2); A. speciosa (*c-h, p, g,* and *w*; 2); Arthropodium neo-caledonicum (*c-h, w*; 1½); A. paniculatum (*c-h, w*; 3); A. pendulum (*c-h, w*; 1½); Arum palæstinum (*c-h, p, bk,* and *y-w*); Astilbe japonica (*c-h, w*; 1-2); Barbacenia purpurea (*c-h, p*; 1½); B. Rogieri (*c-h, p*; 1½); Batatas bignonioides (*st, p*); B. Cavanillesii (*st, w-r*); B. edulis (*st, w* and *p*); B. paniculata (*st, p*); Begonia acutiloba (*i-h, w*); B. albo-coccinea (*st, pi* and *w*; ½-¾); B. amabilis (*i-h, pi* or *w*; ¾); B. amœna (*i-h, pi*; ½); B. Berkeleyi (*i-h, pi*); B. boliviensis (*i-h, r*; 2); B. Bruantii (*i-h, w* or *pi*); B. Chelsoni (*i-h, o-r*; 2); B. Clarkii (*i-h, r*); B. coriacea (*i-h, pi*; ¾); B. dædalea (*i-h, w* and *pi*; *fol g* and *br*); B. Davisii (*i-h, r*; *fol g, r* beneath; ¼-½); B. Dregii (*i-h, w*; 1); B. echinosepala (*i-h*; 1½); B. Evansiana (*c-h, pi*; 2); B. eximia (*i-h, fol p* and *r*); B. Frœbeli (*i-h, r*); B. geranifolia (*i-h, r* and *w*; 1); B. geranioides (*i-h, w*); B. glandulosa (*i-h, g-w*); B. gogoensis (*st, pi*; *fol* bronzy, *r* beneath); B. gracilis (*c-h, pi*) and vars.; B. heracleifolia (*st, pi*) and vars.; B. herbacea (*i-h, w*); B. hydrocotylifolia (*i-h, pi*; 1); B. imperialis (*i-h, w*; *fol* olive-*g,* banded *gy-g*); B. laciniata (*i-h, w,* tinted *pi*; *fol g*); B. manicata (*st, pi*); B. maxima (*i-h, w*); B. megaphylla (*i-h, w*); B. monoptera (*i-h, w*; 1-2); B. natalensis (*c-h, pi*; *fol g,* spotted *w*; 1½); B. Pearcei (*i-h, y*; *fol g, r* beneath; 1); B. picta (*i-h, pi*; *fol* sometimes variegated; ½-1); B. prismatocarpa (*st, o* and *y*; *fol g*); B. pruinata (*i-h, w*); B. Rex (*st, fol* variegated) and vars.; B. Richardsiana (*i-h, w*; 1); B. R. diadema (*i-h, w*); B. rosæflora (*i-h, pi-r*); B. rubro-venia (*i-h, w,* veined *pi-r*; 1-1½); B. scandens (*i-h, w*); B. Schmidtiana (*i-h, w*; 1); B. semperflorens (*i-h, w* or *pi*) and vars.; B. socotrana (*st, pi*); B. stigmosa (*i-h, w*; *fol g,* blotched *br-p*); B. strigillosa (*i-h, pi*; *fol g,* margined *r*); B. Sutherlandi (*i-h, o-r*; *fol g,* nerved *r*); B. Thwaitesii (*st, fol g, r-p, w,* and *r*); B. Veitchii (*i-h, r*; 1); B. Verschaffeltiana (*i-h, pi*); B. xanthina (*i-h, y*; *fol g, p* beneath; 1); B. varieties (*i-h*); Bignonia Roezlii (*st*); Blandfordia aurea (*c-h, y*; 1-2); B. Cunninghamii (*c-h, r* and *y*; 3); B. flammea (*c-h, y*; 2); B. f. elegans (*c-h, r,* tipped *y*; 2); B. f. princeps (*c-h, o-r, y* within; 1); B. grandiflora (*c-h, r*; 2); B. nobilis (*c-h, o,* margined *y*; 2); Bomarea Caldasiana (*c-h, o-y,* spotted *r*);

Tender—*continued.*

B. Carderi (*c-h, pi* and *p-br*); B. oligantha (*c-h, r, y* within); B. patococensis (*c-h, r*); B. Shuttleworthii (*c-h, o-r, y,* &c.); B. Williamsii (*c-h, pi*); Brachyspatha variabilis (*st, g-p* and *w*; 3); Brunsvigia Cooperi (*c-h, y*; 1½); B. falcata (*c-h, r*; ¾); B. Josephinæ (*c-h, r*; 1½); B. multiflora (*c-h, r*; 1); B. toxicaria (*c-h, pi*; 1); Bulbine alooides (*c-h, y*; 1); Caladium argyrites (*st, fol g,* &c.); C. bicolor (*st*; 2); C. Chantinii (*st, fol r, w,* and *g*); C. Devosianum (*st, fol g,* blotched *w* and *p*); C. Kochii (*st, fol g,* spotted *w*); C. Lemaireanum (*st, fol g,* veined *w*); C. Leopoldi (*st, fol g, r,* and *p*); C. macrophyllum (*st, fol g,* blotched *g-w*); C. maculatum (*st, fol g,* spotted *w*); C. marmoratum (*st, fol g,* and *gy* or *si*); C. rubrovenium (*st, g-gy,* veined *r*); C. sanguinolentum (*st, fol g, w,* and *r*); C. Schomburgkii (*st, fol g,* veined *w*); C. Verschaffeltii (*st, fol g,* spotted *r*); C. varieties (*st*); Caliphruria Hartwegiana (*c-h, g-w*; 1); C. subedentata (*c-h, w*; 1½); Callipsyche aurantiaca (*c-h, y*; 2); C. eucrosioides (*c-h, r* and *g*; 2); C. mirabilis (*c-h, g-w*; 3); Calochortus albus (*c-h, w,* blotched); C. Benthami (*c-h, y*; ¼-¾); C. cœruleus (*c-h, l,* dotted *b*; ¼-½); C. elegans (*c-h, g-w* and *p*; ¾); C. Gunnisoni (*c-h, l, y-g,* and *p*); C. lilacinus (*c-h, pi*; ½-¾); C. luteus (*c-h, g* and *y*; 1); C. Nuttallii (*c-h, g* and *w,* marked *r* and *p*; 1); C. pulchellus (*c-h, y*; 1); C. purpureus (*c-h, g, p,* and *y*; 3); C. splendens (*c-h, l*; 1½); C. venustus (*c-h, w* and *r*; 1½) and vars.; Canarina Campanula (*c-h, y-p* or *o,* nerved *r*; 3-4); Canna Achiras variegata (*i-h, r*; *fol g,* striped *w* and *y*); C. Annæi (*i-h, pi*; 6) and vars.; C. Auguste Ferrier (*i-h, o-r*; *fol g,* margined *p-r*; 10); C. Bihorelli (*i-h, r*; *fol* bronzy; 6-7); C. Député Henon (*i-h, y*; 4); C. discolor (*i-h, r*; *fol g* and *r*; 6); C. expansa-rubra (*i-h, p*; *fol r*; 4-6); C. gigantea (*i-h, o-r* and *p*; 6); C. indica (*i-h, r* and *y*; 3-6); C. iridiflora (*st, pi,* spotted *y*; 6-8); C. limbata (*i-h, y-r*; 3); C. nigricans (*i-h*; *fol r*; 4½); C. Rendatleri (*i-h, pi-r*; *fol g,* tinged *r*; 6-8); C. speciosa (*i-h, r*; 3); C. Van Houttei (*i-h, r*; *fol g,* margined *p-r*); C. Warscewiczii (*i-h, r* and *p*; *fol g,* tinged *p*; 3); C. zebrina (*i-h, o*; *fol g* and *r*; 6-8); Carpolysa spiralis (*c h, w, r* outside); Cienkowskia Kirkii (*st, pi-p, sc*; ½); Clivia nobilis (*c-h, r* and *y*; 1½); Colocasia esculenta (*c-h, w*; 2); C. odorata (*st, w, sc*); Commelina cœlestis (*c-h, b*; 1½); C. c. alba (*c-h, w*; 1½); Corynophallus Afzelii vars. (*st, p* and *w*); Costus igneus (*st, o-r*; 1-3); C. Malorticanus (*st, y,* banded *o-r*; 1-3); Crinum amabile (*st, r, sc*; 2-3); C. asiaticum (*c-h, w*; 1½-2); C. Balfourii (*st, w, sc*; 1½); C. Careyanum (*i-h, w,* tinged *r*; 1); C. cruentum (*st, r*; 3); C. giganteum (*st, w, sc*; 2-3); C. Kirkii (*st, w,* striped *r*; 1-1½); C. Macowani (*c-h, w,* tinged *p*; 2-3); C. Moorei (*c-h, w,* flushed *r*; 1½-2); C. purpurascens (*st, w,* tinted *r*; 1); C. zeylanicum (*st, w,* banded *r*; 2-3); Curcuma albiflora (*st, w* and *y*; 2); C. australasica (*st, y,* bracts *pi*); C. cordata (*st, r-y*; 1); C. petiolata (*st, y,* bracts *pi-p*; 1½); C. Roscoeana (*st, r,* bracts *o*; 1); C. rubricaulis (*st, r,* 3); Cyanella odoratissima (*c-h, pi, sc*; 1); Cyclamen africanum (*c-h, w* or tinted *r,* spotted *p*; ½-1); C. cilicium (*c-h, w,* blotched *p*; ¼); C. Coum (*c-h, r*; ¼) and vars.; C. ibericum (*c-h, r,* spotted *p*; ¼) and vars.; C. neapolitanum (*c-h, w* or *r,* spotted *v-p*); C. persicum (*c-h, w,* blotched *p*) and vars.; Cyrtanthus sanguineus (*c-h, y* and *r, o-r* inside); Dahlia imperialis (*c-h, w, l,* and *r*; 10-12); D. Juarezii (*c-h, r*; 3); Dioscorea multicolor (*st, fol* variegated) and vars.; Dracontium asperum (*st, p-br*; 5-6); D. Carderi (*st*; 3); Drimiopsis Kirkii (*c-h, w*; ¾); Drosera binata (*c-h, w*; ½); Elisena longipetala (*c-h, w*; 3); Eucharis candida (*st, w*; 2); E. grandiflora (*st, w*; 2); E. Sanderiana (*st, w*; 1½); Eurycles Cunninghami (*i-h, w*; 1); Freesia Leichtlinii (*c-h, y* or *c*; 1); F. refracta (*c-h,* sometimes marked *v* and *o*); F. r. alba (*c-h, w*); Galaxia ovata (*c-h, y*); Geissorhiza grandis (*c-h, y,* ribbed *r*); G. inflexa (*c-h, y,* spotted *p*; 1½); G. Rochensis (*c-h, b,* spotted *r*; ¾); Gesnera Cooperi (*st, r,* throat spotted; 2); G. discolor (*st, r*; 2); G. Donkelaariana (*st, r*; 1); G. exoniensis

Tender—*continued.*

(*st, o-r*, throat *y*); G. nægelioides (*st, pi, r*, and *y*); G. pyramidalis (*st, o-r* and *o*, spotted); G. varieties (*st*); Gloriosa superba (*st, o* and *y*; 4); Gloxinia diversifolia (*st*); G. gesneroides (*st, r*); G. glabra (*st, w* and *y*, spotted *p*; ¾); G. maculata (*st, p b*; 1); G. pallidiflora (*st, b*; 1); G. varieties (*st*); Griffinia Blumenavia (*i-h, w*, streaked *pi*; ½-¾); G. dryades (*i-h, p-l* and *w*; 1½); G. hyacinthina (*i-h, b* and *w*; ¾); G. ornata (*i-h, b-l* and *w*; 1-1½); Hæmanthus abyssinicus (*st, r*; ½); H. cinnabarinus (*st, r*; 1); H. Kalbreyeri (*st, r*; ½); H. Katherinæ (*st, r*); H. puniceus (*st, o-r*, stamens *y* or *o*; 1); Hedychium angustifolium (*st, r*; 3-6); H. coronarium (*st, w, sc*; 5); H. flavosum (*st, y, sc*; 2-3); H. flavum (*c-h, o, sc*; 3); H. Gardnerianum (*c-h, g-y, sc*; 3-5); Hessea crispa (*c-h, pi*; ¼); Hippeastrum Ackermanni (*st, r*) and var.; H. aulicum (*c-h, r, g*, and *r-p*; 1½); H. equestre (*st, o-g*) and vars.; H. pardinum (*c-h, g*, spotted *r*); H. reticulatum (*st, pi* and *w*); H. vittata (*c-h, w*, striped *r*); Homalomena Roezlii (*st, o-br, c* within; ½); H. Wallisii (*st, r*); Hyacinthus amethystinus (*c-h, b*; ¼-1); H. corymbosus (*c-h, l-pi*; ¼); H. orientalis (*c-h*, variable, *sc*; ¾-1); H. o. albulus (*c-h, w*); H. varieties (*c-h, sc*); Hymenocallis amœna (*c-h, w, sc*; 1-2); H. calathinum (*c-h, w, sc*); H. macrostephana (*st, w, sc*; 2); H. speciosa (*st, w, sc*; 1-1½); Hypoxis stellata (*c-h, w* and *b*; ¾); Imantophyllum Gardeni (*c-h, r-o* or *y*; 1-2); I. miniatum (*st, o* and buff; 1-2); I. hybrids (*c-h*); Isoloma hondense (*st, y*; 1); I. molle (*st, r*; 1½); Ixia capillaris (*c-h, pi* or *l*; 1½); I. hybrida (*c-h, w*; 1); I. maculata (*c-h, o*; 1); I. odorata (*c-h, y, sc*; 1); I. patens (*c-h, pi*; 1); I. speciosa (*c-h, r*; ½); I. viridiflora (*c-h, g*, spotted; 1) and vars.; Kæmpferia Gilbertii (*st, fol g*, margined *w*); K. ornata (*st, y; fol g*, banded *si, p* beneath); Lachenalia fragrans (*c-h, y, sc*; ½); L. lilacina (*c-h, l* and *b*; ½); L. Nelsoni (*c-h, y*); L. pendula (*c-h, p, r*, and *y*; ¼-¾); L. purpureo-cærulea (*c-h, p-b*; ½-¾); L. tricolor (*c-h, g, r*, and *y*; 1); L. t. lutea (*c-h, y*; 1); Lilium giganteum (*c h, w*, tinged *g* and *p*; 4-10); L. neilgherrense (*c-h, w, sc*; 2-3); Littonia modesta (*i-h, o*; 2-6); Lycoris aurea (*c-h, y*; 1); L. Sewerzowi (*c-h, br-r, sc*; 1); Marica lutea (*i-h, y, r, w*, and *g*; ½); M. Northiana (*st, w, y, r*, and *b*; 4); Mirabilis Jalapa (*c-h*, variable; 2); Nægelia cinnabarina (*st, r*; 2); N. fulgida (*st, r*; 2); N. f. bicolor (*st, r* and *w*; 2); N. Geroltiana (*st, o-r*; 1½-2); N. multiflora (*st, w* or *c*); N. zebrina (*st, o-r*; 2); Nerine curvifolia (*c-h, r*; 1); N. flexuosa (*c-h, r*, tinged *o*; 1) and vars.; N. sarniensis (*c-h, pi*; 2-2½) and vars.; N. undulata (*c-h, w-pi*; 1); Ornithogalum arabicum (*c-h, w, bk* centre, *sc*; 1-2); O. thyrsoides (*c-h, y*; ½-1½) and vars.; Oxalis Bowiei (*c-h, pi, y* at base; ½-¾); O. elegans (*c-h, p*; ½); O. hirta (*c-h, v* or *r*; ¼) and vars.; O. lasiandra (*c-h, r; fol g*, spotted *p*; ¾-1½); O. Martiana (*c-h, pi*; ½); O. rosea (*c-h, pi*; ½-1); O. variabilis (*c-h, w* or *r*; ¼) and vars.; O. versicolor (*c-h, w, y* outside; ¼); Phædranassa Carmioli (*i-h, r*, tipped *g*; 2); P. chloracea (*c-h, p-pi*, tipped *g*; 1½); P. eucrosioides (*i-h, g* and *r*; 1-1¼); P. Lehmanni (*i-h, r*); P. rubro-viridis (*c-h, r* and *g*); Phormium Cookianum (*c-h, y*, or *y* and *g*; *fol g*; 3-6); P. C. variegatum (*c-h, fol g* and *c-w*); P. tenax (*c-h, y* or *r*; *fol g*, margined *r-br*; 6) and vars.; Plagiolirion Horsmanni (*st, w*); Polianthes tuberosa (*c-h, w, sc*; 3-4) and vars.; Richardia africana (*c-h s-aq, w*, spadix *y*; 2); R. albo-maculata (*c-h s-aq, g-w*; 2); R. melanoleuca (*c-h s-aq, y* and *bk-p*, spadix *w*; 1½); Sandersonia aurantiaca (*c-h, o*; 1½); Sauromatum venosum (*st, p, y*, and *v*; 1); Sinningia barbata (*st, w*, marked *r*; *fol g, r* beneath); S. concinna (*st, p* and *y*; *fol g*, nerved *r*) and var.; S. conspicua (*st, y*, marked *p*); S. speciosa (*st, v* &c.; *fol g*, &c.) and vars.; S. Youngiana (*st, v* or *p*, and *y-w*; *fol g, g-w* below); Sparaxis grandiflora (*c-h, p, w*, or variegated; 1-2); S. pendula (*c-h, l*; 4); S tricolor (*c-h, o, y*, and *bk*; 1-2); S. varieties; Sprekelia formosissima (*c-h, r* or *w*; 2); Stenomesson coccineum (*c-h, r*; 1); S. incarnata (*c-h, r*; 2) and vars.; S. vitellinum (*i-h, y*; 1); Streptanthera elegans (*c-h, w, w-pi, p*, and *y*; ¾); Synnotia variegata (*c-h, y* and *v*; 1½); Tacca pinnatifida (*st, p*); Taccarum Warmingianum (*st, br; fol g*, lined *w*; 3); Thysanotus tuberosus (*c-h, p*; ½-1); Tigridia atrata (*c-h, p, g*, and *br*; 2); T. Meleagris (*c-h p*, banded *r*; 1½); T. Van Houttei (*c-h, y, l*, and *p*; 1); Tritonia crocata (*c-h, y*; 2); T. crocosmiflora (*c-h, o-r*); T. miniata (*c-h, r*; ¾-1); Tropæolum azureum (*c-h, b*); Tydæa amabilis (*st, pi*, dotted *p*; 1-2); Vallota purpurea (*c-h, r*; 2-3) and vars.; Wahlenbergia tuberosa (*c-h, w*, banded *pi-r*; ½-2); Watsonia deniflora (*c-h, pi-r*; 1½-2); W. Meriana (*c-h, p* or *r*; ¾-2); W. rosea (*c-h, pi*; 2); Xanthosoma Lindeni (*c-h, fol g*, veined *w*); Zephyranthes Andersoni (*c-h, y* or *y-b*; ½); Z. candida (*c-h*; ½); Z. citrina (*i-h, y*; ½-1).

AN INDEX TO ORCHIDS.

IN the subjoined lists of Orchids, the plants have been arranged according to the degree of heat necessary to bring them to perfection—thus, the "stove" species require to be grown in the East Indian house, those classified as "intermediate" thrive in the Brazilian house, while the "cool-house" species are best suited by the low temperature of the Peruvian house. The few "hardy" species here enumerated are almost all natives of Britain or of North America, and, being all terrestrial, are well adapted for culture in outside borders.

The habit of each plant is stated immediately after the name, the epiphytal species being marked *eph*, and the terrestrial ones *ter*; while *s-ter* indicates subjects of a sub-terrestrial habit of growth.

The colours are generally arranged according to their importance, the prevailing hue being stated first in each instance. In many species, however, the markings are often very variable, so that the colours here mentioned may perhaps be found to differ slightly from those actually seen in a particular specimen. In such cases the markings most frequently found have been given.

The species of *Anœctochilus* and *Physurus* stand in strong contrast to the other members of the Order, being grown only for their handsome foliage, and not for the beauty of their flowers, which are small and unattractive. The descriptive colours in these cases, therefore, apply only to the foliage, as indicated by the abbreviation *fol*, preceding the colours.

For much interesting information relative to the structural peculiarities of these plants, see "Orchideæ" and "Orchid Fertilisation," in Vol. II. Full instructions as to general culture are given in the article on "Orchid House," and the special requirements of the more important genera will be found under their respective headings.

The following abbreviations are used:—

b, blue; *bk*, black; *br*, brown; *c*, cream; *eph*, epiphytal; *fol*, foliage; *g*, green; *l*, lilac; *m*, magenta; *mv*, mauve *o*, orange; *p*, purple; *pi*, pink; *r*, red; *sc*, scented; *si*, silver; *s-ter*, sub-terrestrial; *ter*, terrestrial; *v*, violet, *w*, white; *y*, yellow.

HARDY.—Aplectrum hyemale (*ter, g-br*); Arethusa bulbosa (*ter, pi-p, sc*); Bletia hyacinthina (*ter, p*); Calopogon pulchellus (*ter, p*, bearded *y*); Calypso borealis (*ter, pi* and *br*, crested *y*); Cephalanthera grandiflora (*ter, w* and *y*); Cypriedium acaule (*ter, g, pi* and *p*) and var.; C. arietinum (*ter, g-br, r* and *w*); C. Calceolus (*ter, r-br* or *p*, and *y*); C. candidum (*ter, g-br*, lip *w*); C. guttatum (*ter, w*, blotched *pi-p*); C. macranthum (*ter, p*); C. parviflorum (*ter, br-p* and *y, sc*); C. pubescens (*ter, y-br* and *y*); C. spectabile (*ter, w* and *pi*); Habenaria blephariglottis (*ter, w*); H. cristata (*ter, y*); H. fimbriata (*ter, l-p*); H. psycodes (*ter, pi* to *r, sc*); Liparis lilifolia (*ter, br-p*); Ophrys apifera (*ter, g* and *pi*); O. lutea (*ter, g, y,* and *p*); O. Speculum (*ter, g, b, y,* and *p*); Orchis foliosa (*ter, p*); O. latifolia (*ter, p* or *r*); O. maculata (*ter, p* or *w*, spotted *p-br*); O. purpurea (*ter, g, p,* and *pi*); Serapias cordigera (*ter, br* and lavender).

COOL-HOUSE—Acineta Barkeri (*s-ter, y* and *r, sc*); A. Humboldtii (*s-ter, y*, dotted *br*); Acrides japonicum (*eph, w* and *p*); Angræcum falcatum (*eph, w* and *br, sc*); Barkeria elegans (*eph, pi* and *r*); B. Lindleyana (*eph, pi-p* and *w*); B. L. Centeræ (*eph, pi-l*); B. melanocaulon (*eph, pi-l* and *r-p*); B. Skinneri (*eph, pi-p*); B. S. superbum (*eph, pi*, streaked *y*); B. spectabilis (*eph, pi-l, w,* and *r*); Calochilus paludosus (*ter, g* and *br*); Cœlogyne corrugata (*eph, w, y,* and *o*); C. Gowerii (*eph, w*, blotched *y*); Coryssanthes picta (*ter, p* and *y*); Cypripedium Fairieanum (*ter, w, g, p,* and *br*); C. venustum (*ter, g-w* or *pi*, and *y-g*); Disa grandiflora (*ter, pi, r,* and *y*); D. g. Barrellii (*ter, o-r*, veined *r*); D. mogaceras (*ter, w*, blotched *p*); Epidendrum altum majus (*eph, y*, striped *p*); E. atropurpureum (*eph, pi* or *p*, blotched *r-p*); E. cnemidophorum (*eph, y, br, w,* and *pi*); E. dichromum (*eph, pi* and *r*) and var.; E. paniculatum (*eph, p* or *l-p,* and *y*); E. prismatocarpum (*eph, y-g, l-p, w,* and *p* or *bk, sc*); Goodyera discolor (*ter, w*, blotched *y*); G. macrantha (*ter, pi*); G. pubescens (*ter, w*); G. velutina (*ter, w*, shaded *pi*); Habenaria rhodochila (*eph, g* and *r*); Lælia majalis (*eph, si-l, r-p,* &c.); Masdevallia amabilis (*eph, o-r*); M. Backhousiana (*eph, y* and *bk*); M. bella (*eph, p-br* and *y*); M. chelsoni (*eph, w*, marked *mv*); M. Chimæra (*eph, y* and *bk*); M. coccinea (*eph, y* and *r*); M. Davisii *eph, o-y*); M. ephippium (*eph, p-br* and *y*); M. erythrochæte (*eph, w, y,* and *r-p*); M. Estradæ (*eph, p-mv* and *y*); M. floribunda (*eph, w, y,* and *br-p*); M. Gaskelliana (*eph, mv-p* and *y*); M. gemmata (*eph*, ochre, *o,* and *p*); M. ignea (*eph, r*); M. ionocharis (*eph, w-y*, blotched *p*); M. Lindeni (*eph, v, pi,* or *m, w* eye) and vars.; M. melanopus (*eph, w, p,* and *y*); M. polysticta (*eph, w*, spotted *r*); M. Reichenbachiana (*eph, w-y* and *r*); M. Roezlii (*eph, bk-p* and *mv*); M. Schlimii (*eph, y*, spotted *br-r*); M. Shuttleworthii (*eph, p, g,* and *y*); M. splendida (*eph, r-v* and *w*); M. tovarensis (*eph, w*); M. triaristella (*eph, br* and *y*); M. triglochin (*eph, r* and *y*); M. Veitchiana (*eph, y, o-r,* and *p*); M. Wallisii (*eph, y, r,* and *r-p*); Nanodes Medusæ (*eph, g, br,* and *p*); Odontoglossum blandum (*eph, y-w*, spotted *p-r*); O. constrictum Sanderianum (*eph, y, br, w,* &c.); O. coronarium (*eph, r-br* and *y*); O. crispum (*eph, w, y,* and *r-b*) and vars.; O. cristatum (*eph, c-y, w,* and *br* or *p*); O. Dormanianum (*eph, w* and *y*, spotted); O. elegans (*eph, y* and *w*, blotched *br* and *r*); O. grande (*eph, o-y* and *c-w*, blotched *br*); O. Hallii (*eph, y, br, w,* and *p*); O. hastilabium (*eph, c-w, w-br, w,* and *pi, sc*); O. lævе (*eph, br, y, w,* and *v, sc*); O. Lindenii (*eph, y*); O. Londesboroughianum (*eph, y*); O. luteo-purpureum (*eph, br* or *p, w,* and *y*) and vars.; O. maculatum (*eph, y*, spotted *br* and *br-r*); O. odoratum (*eph, y, br, w,* and *p, sc*); O. o. Leeanum (*eph, y*, spotted *br*); O. Pescatorei (*eph, w*, blotched *p-r* and *y*); O. pulchellum majus (*eph, w, y,* and *p*); O. Rossii (*eph, w, br,* and *y*); O. R. Warnerianum (*eph, w, br, pi,* and *y*); O. Schilleranum (*eph, y, br,* and *p*); O. tripudians (*eph, br, y-g, w,* and *p-v*); O. triumphans (*eph, y, br-r, pi,* and *w*); O. Uro-Skinneri (*eph, g, w, r-br,* &c.); O. Wilckeanum (*eph, w-y, br,* &c.); Oncidium æmulum (*eph, br, p-v,* and *y*); O. Carderi (*eph, br, w, y,* and *pi*); O. concolor (*eph, y*); O. cornigerum (*eph, y*, spotted *r*); O. cucullatum (*eph, p-br, pi-l* or *pi-p,* and *p*); O. c. macrochilum (*eph, p, r, mv,* and *v*); O. diadema (*eph, br*, lip *y*); O. incurvum (*eph, w*, marked *l* and *br, sc*); O. ornithorhynchum (*eph, pi-p, sc*) and var.; O. Phalænopsis (*eph, c, r, v, c-w,* and *y*); O. Warscewiczii (*eph, y, w,* and *br*); O. Wentworthianum (*eph, g-y*, barred *br*); Pterostylis Baptistii (*ter, g*, marked *w* and *br*); Sarcochilus Fitzgeraldi (*eph, w*, spotted *r*); Satyrium aureum (*ter, o*, shaded *r*); S. coriifolium (*ter, y*); S. nepalense (*ter, pi, sc*); Sophronitis grandiflora (*eph, r*); S. militaris (*eph, r* and *y*); Spathoglottis Fortunei (*ter, y*, blotched *r*); Zygophyllum cœleste (*eph, b, w, v, y,* &c.); Z. crinitum (*eph, g, br,* and *w* or *c*); Z. Gautieri (*eph, g, br, p-b,* &c.); Z. Mackayi (*eph, y-g, br-p, w, b,* &c.); Z. maxillare (*eph, g, br,* and *b-p*); Z. Sedeni (*eph, p-br, b-p,* and *g*); Z. Wallisii (*eph, c-w* and *v*).

Cool-house—*continued.*

INTERMEDIATE HOUSE.—Anguloa Clowesii (*eph, y* and *w, sc*); A. eburnea (*eph, w*, spotted *pi*); A. Ruckeri (*eph, y* and *r*) and var.; A. uniflora (*eph, w, br,* and *pi*); Arpophyllum giganteum (*eph, p* and *pi*); A. spicatum (*eph, r*); Batemannia grandiflora (*eph, g, r-br, w,* &c.); B. Wallisii (*eph, g, br,* &c.); Bletia florida (*ter, pi*); B. Shepherdii (*ter, p* and *y*); B. Sherrattiana (*ter, pi-p*, marked *w* and *y*); Brassavola Digbyana (*eph, c-w*, streaked *p*); B. Gibbsiana (*eph, w*, spotted *br*); B. glauca (*eph, y, o,* and *w, sc*); B. lineata (*eph, c* and *w, sc*); B. venosa (*eph, c* and *w*); Brassia antherotes (*eph, y, br,* and *bk*); B. caudata (*eph, y* and *br*); B. Lanceana (*eph, y,* and *br* or *r, sc*) and vars.; B. Lawrenceana (*eph, y, br,* and *g, sc*) and var.; B. maculata (*eph, y-g*, blotched *br*) and var.; B. verrucosa (*eph, g*, blotched *bk-p*, and *w*) and var.; Bulbophyllum barbigerum (*eph, g-br*); B. Lobbi (*eph, y*, spotted *p*); B. reticulatum (*eph, w*, striped *p*); B. siamense (*eph, y*, striped *p*); Calanthe Masuca (*ter, v*); C Sieboldii (*ter, y*); C. veratrifolia (*ter, w*); Cattleya amethystoglossa (*eph, pi-l, p,* &c.); C. bicolor (*eph, br-g* and *pi-p*); C. chocoensis (*eph, w, y,* and *p*); C. crispa (*eph, w* or *w-l,* and *r*); C. Dawsoni (*eph, pi-p, y,* and *pi*); C. Devoniana (*eph, w, pi,* and *pi-p*); C. dolosa (*eph, pi* and *y*); C. Dominiana (*eph, w, pi-p, pi,* and *o*) and vars.; C. Dowiana (*eph, y, p,* and *v-pi*); C. eldorado (*eph, pi, p-r,* and *o*); C. e. splendens (*eph, pi, o, w,* and *v-p*); C. exoniensis (*eph, pi-l, p,* and *y*); C. gigas (*eph, pi, p* or *r-v,* and *y*) and var.; C. granulosa (*eph, y-g, w, br,* and *r*); C. guatemalensis (*eph, pi-p*, buff, *r-p, o,* &c); C. guttata (*eph, g, w, p, y,* and *r*) and vars.; C. Harrisoniæ (*eph, pi*, tinged *y*) and var.; C. intermedia (*eph, pi* or *pi-p* and *v-p*) and vars.; C. labiata (*eph, pi* and *r*) and vars.; C. marginata (*eph, pi-r, pi,* and *w, sc*) and vars.; C. maxima (*eph, pi, w, p-r,* and *o*); C. Mendelli (*eph, w* to *pi* and *m*); C. Mossiæ (*eph, pi,* &c.) and vars.; C. Regnellii (*eph, g, b, pi-p, w,* &c.); C. Sedeniana (*eph, pi, g, w,* and *p*); C. Skinneri (*eph, pi-p* and *w*); C. speciosissima (*eph, pi-w, b, w,* and *y*); C. Trianæ (*eph, pi-w, o* or *y,* and *p*) and vars.; C. Wagneri (*eph, w* and *y*); C. Walkeriana (*eph, pi* and *y, sc*); C. Warneri (*eph, pi* and *r*) and vars.; C. Warscewiczii (*eph, p-w* and *r*); Cœlia Baueriana (*eph, w, sc*); C. macrostachya (*eph, r*); Cœliopsis hyacinthosma (*eph, w,* &c.); Cœlogyne odoratissima (*eph, w*, stained *y, sc*); C. ciliata (*eph, y* and *w*, marked *br*); C. cristata (*eph, w* and *y, sc*); C. Cumingii (*eph, y* and *w*); C. flaccida (*eph, w*, marked *y* and *r, sc*); C. Hookeriana (*eph, pi-p, w, br,* and *y*); C. humilis (*eph, w, pi, r,* and *br*); C. maculata (*eph, w*, marked *r*); C. media (*eph, c-w, y,* and *br*); C. ocellata (*eph, w, y, br,* and *o*) and var.; C. plantaginea (*eph, g-y, w,* and *br*); C. Schilleriana (*eph, y*, blotched *p*); C. speciosa (*eph, br* or *g, r,* and *w*); C. sulphurea (*eph, y-g, w,* and *y*); C. viscosa (*eph, w*, streaked *br*); C. Wallichiana (*eph, pi*, striped *w, sc*); Comparettia coccinea (*eph, r*, tinged *w*); C. falcata (*eph, pi-p*); C. macroplectron (*eph, pi*, marked *r*); C. rosea (*eph, pi*); Cymbidium eburneum (*eph, w* and *y, sc*); C. Mastersii (*eph, w*, stained *pi, sc*); C. sinense (*eph, br, p,* and *y-g, sc*); Cypripedium insigne (*ter, y-g, y, r-br,* and *w*) and vars.; Dendrobium aureum (*eph, y*, marked *br* and *p*,

Intermediate House—*continued.*

sc); Epidendrum evectum (*eph, pi-p*); Gongora maculata (*eph, y*, spotted *pi-r*); Grobya Amherstiæ (*eph*, ochre-spotted); Lælia albida (*eph, w, pi*, and *y, sc*); L. anceps (*eph, pi-l, pi*, and *l, sc*) and vars.; L. autumnalis (*eph, pi* and *y, sc*) and var.; L. caloglossa (*eph, p* and *w*); L. cinnabarina (*eph, o-r*); L. Dayana (*eph, pi-p, p, l*, and *w*); L. Dominiana (*eph, p*); L. Dormaniana (*eph*); L. elegans (*eph, w, pi*, or *r*, and *p*) and vars.; L. flammea (*eph, o-r* and *p-r*); L. harpophylla (*eph, o-r* and *w*); L. Jongheana (*eph, b-p, y*, and *w*); L. Lindleyana (*eph, w* or *pi, y*, &c.); L. monophylla (*eph, o-r*); L. Perrinii (*eph, pi-p* and *r*); L. Philbrickiana (*eph, br, p*, and *w*); L. præstans (*eph, pi* and *r-p*); L. purpurata (*eph, w* and *p-r*) and vars.; L. superbiens (*eph. pi, r*, and *y*); L. Veitchiana (*eph, l, p*, and *y*); L. Wallisii (*eph, pi* and *y*); L. xanthina (*eph, y, w*, and *o*); Lycaste aromatica (*eph, y*); L. cristata (*eph, w* and *p*); L. Deppei (*eph, y, w, br*, and *r*); L. jugosa (*eph, c, w*, and *p*); L. lasioglossa (*eph, br, y*, and *p*); L. Skinneri (*eph, w, pi-l*, and *r*) and vars.; Maxillaria grandiflora (*ter, w, y*, and *r*); M. luteo-alba (*ter, c-w*); M. luteo-grandiflora (*ter, c-w, o*, and *br-r*); M. splendens (*ter, w, o*, and *pi*); M. variabilis (*ter, p*); M. venusta (*ter, w, y*, and *r*); Miltonia candida (*eph, y, w, br*, and *pi*); M. Clowesii (*eph, y, br*, and *p*); M. cuneata (*eph, br, y-g, w*, and *pi*); M. flavescens (*eph, y*, spotted *r*); M. Lamarcheana (*eph, y* and *br*); M. Phalænopsis (*eph, w* and *p-r*); M. Regnelli (*eph, w-pi* and *l-pi*) and var.; M. spectabilis (*eph, w* and *pi-v*) and vars.; M. vexillaria (*eph, pi, w*, and *r*); M. Warscewiczii (*eph, br, v-p, br-r*, &c.); Odontoglossum bictonense (*eph, y-g, br-p, l*, &c.) and vars.; O. Cervantesii (*eph, pi-l, r-br*, and *w*); O. cirrhosum (*eph, c-w, p-v*, &c.); O. citrosmum (*eph, w*, lip *p, sc*); O. Insleayi (*eph, y* or *y-g, r-br, y*, and *br*); O. maxillare (*eph, w, p-br*, and *o*); O. pulchellum (*eph, w*, dotted *p, sc*); O. Rossii Ehrenbergii (*eph, w*, barred *br*); Oncidium annulare (*eph, br* and *y*); O. calanthum (*eph, y*, stained *r*); O. chrysothyrsus (*eph, g, r*, and *y*); O. crispum (*eph, r-br* and *g-y*) and vars.; O. dasystyle (*eph*, ochre, *br-p* and *p*); O. divaricatum (*eph, y* and *br*); O. euxanthinum (*eph, g-y, br*, and *y*); O. excavatum (*eph, y*, blotched *br*); O. flexuosum (*eph, y*, spotted *br*); O. Forbesii (*eph, r-br, w*, and *y*); O. Jonesianum (*eph, w*-ochre, *br*, and *p*); O. leucochilum (*eph, g*, banded *br* or *r*, and *w* or *y*); O. macranthum (*eph, y* and *p-br*); O. Marshallianum (*eph, y*, blotched *br*); O. oblongatum (*eph, y*); O. prætextum (*eph, br* and *y, sc*); O. rupestre (*eph, y*, spotted *br*); O. sarcodes (*eph, o-y*, blotched *r*); O. serratum (*eph, br*, bordered *y*); O. splendidum (*eph, g*, barred *br*; lip *y*); O. tigrinum (*eph, br*, barred *y*, lip *y, sc*); O. varicosum (*eph, g, br*, and *y*); O. v. Rogersii (*eph, y*); Phaius albus (*eph, w*, marked *y* and *pi*); P. Bensonæ (*pi-p, w*, and *y*); P. bicolor (*eph, r-br, pi, y*, and *w*); P. Dodgsonii (*eph, w* and *r-br*); P. grandifolius (*ter, br* and *w*) and var.; P. irroratus (*c-w, pi*, and *y*); P. Marshalliæ (*w*, marked *y*); P. Wallichii (*ter, o-y* or *p-y*); Physurus argenteus (*ter, fol g* and *si*); P. nobilis (*ter, fol g*, veined *si*); P. pictus (*ter, fol g, w*, and *si*); Pogonia Fordii (*ter, y, br, w*, and *pi*); P. Gammieana (*ter, l, pi*, and *g*); Ponthieva maculata (*ter, br, w, y*, and *r-br*); Renanthera coccinea (*eph, r*); Selenipedium Ainsworthii (*ter, w* or *y-g*, and *p*); S. calurum (*ter, g, p, pi-r*, and *r*); S. caricinum (*ter, g, w, br*, and *bk*); S. caudatum (*ter, y, r-br*, and *br*); S. Dominianum (*ter, y-g, r-br*, and *p*); S. grande (*ter, y-w, r, y-g*, &c.); S. Lindeni (*ter, w, g*, and *p-r*); S. Roezlii (*ter, y-g, r-p*, &c.); S. Schlimii (*ter, w* and *pi*); S. Schröderæ (*ter, r-g, g-p, r*, &c.); S. Sedeni (*ter, g-w, w*, and *r*); Sobralia macrantha (*ter, p* and *r, sc*); Spiranthes cinnabarina (*ter, y-pi* and *y*); S. colorans (*ter, r*); Stelis Bruckmülleri (*eph, y-p* and *p*); S. ciliaris (*eph, p*); Trichocentrum albo-purpureum (*eph, br, y, w*, and *p*); T. orthoplectron (*eph, br, y, w*, and *r*); T. Pfavii (*eph, br* and *w*, blotched *r*); T. tigrinum (*eph, g-y, p-br, w*, and *p*); Trichopilia crispa (*eph, r* and *w*); T. fragrans (*eph, y-g, w*, and *o, sc*); T. Galleottiana (*eph, g, br, y*, and *r-p*); T. marginata (*eph, br-r, g-y, w*, &c.); T. nobilis (*eph, w* and *o*,

Intermediate House—*continued.*

sc); T. suavis (*eph, w, y*, and *v-pi, sc*); Vanda cærulea (*eph, b*); Zygopetalum brachypetalum (*eph, br, g, w, b-v*, and *b*); Z. citrinum (*eph, y*, blotched *r*); Z. Clayi (*eph, p-br, g, v-p*, &c.); Z. Klabochorum (*eph, w, p, y-g*, &c.) and vars.

STOVE.—Acanthophippium bicolor (*ter, p* and *y*); A. Curtisii (*ter, p* and *y*, &c.); Acriopsis densiflora (*eph, g* and *pi*); A. picta (*eph, w, g*, and *p*); Ada aurantiaca (*eph, o-r*, striped *bk*); Aeranthus grandiflora (*eph, y-g*); Aerides affine (*eph, pi*); A. a. superbum (*eph, pi*); A. crassifolium (*eph, p* or *b*, and *w*); A. crispum (*eph, p-pi*); A. c. Warneri (*eph, w* and *pi*); A. c. cylindricum (*eph, w* and *pi*); A. falcatum (*eph, w, pi*, and *r*); A. Fieldingii (*eph, w*, mottled *pi*); A. Houlletianum (*eph, y, w, p*, &c.); A. Lobbii (*eph, w, v*, &c.); A. maculosum (*eph, pi, p-pi*, &c.); A. m. Schrœderi (*eph, w, l*, and *pi*); A. mitratum (*eph, w* and *v*); A. nobile (*eph, w, pi, y*, and *pi-p*); A. odoratum (*eph, c-w* and *pi, sc*); A. o. majus (*eph, c-w* and *pi, sc*); A. o. purpurascens (*eph, w* and *pi*); A. quinquevulnerum (*eph, w, r, p*, and *g, sc*); A. q. Farmeri (*eph, w, sc*); A. roseum (*eph, pi*); A. r. superbum (*eph, pi*); A. virens Ellisii (*eph, w, pi*, and *b*); A. Williamsii (*eph, pi-w*); Aganisia cœrulea (*eph, b, w*, and *v*); A. fimbriata (*eph, w* and *b*); A. pulchella (*eph, w*, blotched *y*); Angræcum arcuatum (*eph, w*); A. bilobum (*eph, w*, tinged *pi*); A. cephalotes (*eph, w*); A. Chailluanum (*eph, w* and *y-g*); A. citratum (*eph, c-w* or *y*); A. eburneum (*eph, g-w* and *w*); A. Ellisii (*eph, w* and *br, sc*); A. Kotschyi (*eph, y-w, sc*); A. modestum (*eph, w*); A. pellucidum (*eph, w*); A. pertusum (*eph, w*); A. Scottianum (*eph, w* and *y*); A. sesquipedale (*eph, w*); Ancectochilus argyroneura (*ter, fol g* and *si*); A. Bullenii (*ter, fol g*, and *r* or *y*); A. Dawsonianus (*ter, fol g* and *r-br*) and var.; A. intermedius (*ter, fol g* and *y*); A. Lowii (*ter, fol g, o-br*, and *y*) and var.; A. Ordianus (*ter, fol g* and *y*); A. Roxburghii (*ter, fol g* and *si*); A. Ruckerii (*ter, fol g*, spotted); A. setaceus (*ter, fol g* and *y*) and vars.; A. striatus (*ter, fol g* and *w*); A. Turneri (*ter, fol* bronze and *y*); A. Veitchii (*ter, fol g*); A. xanthophyllus (*ter, fol g* and *o*); A. zebrinus (*ter, fol g* and *r-br*); Ansellia africana (*eph, g-y, br-r*, and *y*); A. a. gigantea (*eph, y* and *br, sc*); A. a. nilotica (*eph, g-y, br-r*, and *y*); Aspasia epidendroides (*eph, w-y*); A. lunata (*eph, g, w*, and *br*); A. papilionacea (*eph, y, b, o*, and *v*); A. psittacina (*eph, g, br, p, v*, and *w*); A. variegata (*eph, g* and *y-r*); Bifrenaria Hadwenii vars. (*ter, b, y*, &c.); Broughtonia sanguinea (*eph, r*); Burlingtonia Batemanni (*eph, w* and *mv*); B. candida (*eph, w*, stained *y, sc*); B. decora (*eph, w* or *pi*, spotted *r*) and vars.; B. fragrans (*eph, w*, stained *y, sc*); B. rigida (*eph, p-w*, spotted *pi*); B. venusta (*eph, w*, tinged *pi* and *y*); Calanthe Dominyi (*ter, l* and *p*); C. Petri (*ter, w-y*); C. Veitchii (*ter, pi, w* throat); C. vestita (*ter, w*) and vars.; Camarídium ochroleucum (*eph, y-w*); Catasetum callosum (*eph, br-y*); C. maculatum (*eph, g*, spotted *p*); C. Russellianum (*eph, g*); C. saccatum (*eph, p, y*, and *r*); Cattleya Aclandiæ (*eph, br, y, pi*, and *p*); C. superba (*eph, pi*, lip *r*); Chysis aurea (*eph, y*, marked *r*); C. a. Lemminghei (*eph, pi*); C. bractescens (*eph, w*, blotched *y*); C. chelsoni (*eph, y*, marked *r*); C. lævis (*eph, y, o*, and *r*); Cirrhæa Loddigesii (*eph, g-y* and *r*); Cirrhopetalum auratum (*eph, y-w*, marked *r* and *y*); C. Cumingii (*eph, r-p*); C. Medusæ (*eph, y-w*, dotted *pi*); C. Thouarsii (*eph, o, y*, and *r*); C. tripudians (*eph, br* and *p-w*); Cœlogyne asperata (*eph, c, br, y*, and *o*); C. barbata (*eph, w* and *br*); C. Gardneriana (*eph, w* and *y-g*); C. Massangeana (*eph*, ochre and *br*); C. pandurata (*eph, g* and *bk, sc*); Coryanthes macrantha (*eph, y, p, r*, &c.); Cycnoches aureum (*eph, y*); C. barbatum (*eph, g-w*, spotted *pi*); C. chlorochilum (*eph, y-g, sc*); C. Egertonianum (*eph, p*); C. Lehmanni (*eph, pi* and *o*); C. Loddigesii (*eph, br-g*); C. Warscewiczii (*eph, g*); Cymbidium bicolor (*eph, p*, marked *r*); C. canaliculatum (*eph, p-br* and *g-w*); C. Dayanum (*eph, y-w*, streaked *p*); C. Devonianum (*eph, br, w*, and *p*); C. giganteum (*eph, br, y*, and *p*); C. Hookerianum (*eph, g, y*, and *p*); C. Huttoni

Stove—*continued.*

(*eph*, *br* and *w*); C. Leachianum (*eph*, *w-y* and *br*); C. Lowianum (*eph*, *g*, *br*, *p*, and *w-y*); C. Parishii (*eph*, *w* and *o*, spotted *p-br*); C. pendulum purpureum (*eph*, *r* and *w*); Cypripedium Argus (*ter*, *w*, *pi*, *g*, *bk-p*, and *p-br*); C. Ashburtonæ (*ter*, *w*, *g*, *p*, and *y*); C. barbatum (*ter*, *w* and *p*) and vars.; C. Boxallii (*ter*, *g*, *w*, *br-bk*, &c.); C. concolor (*ter*, *c*, speckled); C. Dayanum (*ter*, *w*, *p*, and *g*); C. Druryi (*ter*, *g-y*, *bk*, and *br*); C. euryandrum (*ter*, *w*, *r*, &c.); C. Harrisianum (*ter*, *p*, tipped *w* and *g*); C. Haynaldianum (*ter*, *pi*, *w*, *g*, and *br*); C. Hookeræ (*ter*, *y-br*, *pi-p*, and *y*); C. lævigatum (*ter*, *p*, *g*, and *y*); C. Lawrenceanum (*ter*, *w*, *g*, and *p*); C. Lowii (*ter*, *g*, *p*, and *br*); C. niveum (*ter*, *w*, freckled *br*); C. pardinum (*ter*, *w*, *g*, *p*, &c.); C. Parishii (*ter*, *g-w* and *p*); C. Petri (*ter*, *w*, *br*, and *g*); C. selligerum (*ter*, *w* and *bk-r*); C. Spicerianum (*ter*, *w*, *g*, *p*, and *v*); C. Stonei (*ter w*, *r*, and *p*); C. superbiens (*ter*, *w* and *br*); C. vernixium (*ter*, *br*, *r*, and *g*); C. vexillarium (*ter*, *w*, *g*, *p*, and *br*); C. villosum (*ter*, *o-r*, *g*, *p*, and *br*); Cyrtochilum citrinum (*eph*, *g*); C. maculatum (*eph*, *g*, spotted *pi*); Dendrobium Ainsworthii (*eph*, *w*, *pi*, and *p*, *sc*); D. albo-sanguineum (*eph*, *w*, blotched *r*); D. Boxallii (*eph*, *w*, marked *p* and *y*); D. Brymerianum (*eph*, *y*); D. chrysotis (*eph*, *y*, blotched *p*); D. clavatum (*eph*, *y*, spotted *c*); D. crassinode (*eph*, *w*, *p*, and *o*) and vars.; D. crystallinum (*eph*, *w*, *o*, *p*, and *pi*); D. Dalhousianum (*eph*, *y*, *r*, and *pi*); D. densiflorum (*eph*, *y* and *o*) and vars.; D. Devonianum (*eph*, *w*, *p*, *o*, &c.) and vars.; D. Draconis (*eph*, *w*, marked *r*); D. erythroxanthum (*eph*, *o*, striped *p*); D. Falconeri (*eph*, *w*, marked *p* and *o*); D. Farmeri (*eph*, *y*, tinged *pi*); D. fimbriatum (*eph*, *o*); D. f. oculatum (*eph*, *o*, blotched *p*); D. formosum (*eph*, *w* and *o*); D. Fytchianum (*eph*, *w*); Epidendrum aurantiacum (*eph*, *o*, striped *r*); E. bicornutum (*eph*, *w*, spotted *r*); E. falcatum (*eph*, *g-y* and *y*, *sc*); E. nemorale (*eph*, *mv* or *pi-l*, and *v*); E. syringothyrsis (*eph*, *p*, marked *o* and *y*); Epistephium Williamsii (*ter*, *r-p*); Galeandra Baueri lutea (*ter*, *y*, lined *p*); G. Devoniana (*ter*, *w*, marked *pi*); G. nivalis (*ter*, *y-g* *w*, and *v*); Goodyera Veitchii (*ter*, *r-br*, ribbed *si*); Grammangis Ellisii (*eph*, *y*, *br*, and *w*); Grammatophyllum multiflorum (*eph*, *g*, *br*, and *p*); G. speciosum (*eph*, *y*, *p*, and *r*); Houlletia odoratissima (*eph*, *o-br* and *y*); H. picta (*eph*, *br* and *y*); Lissochilus Horsfallii (*ter*, *br*, *w*, *pi*, *g*, and *p*); L. Krebsii (*ter*, *g*, *p*, and *y*); Luisia platyglossa (*eph*, *p*, or *p* and *w*); Macradenia Brassavolæ (*eph*, *br*, *y*, *w*, and *p*); Microstylis calophylla (*ter*, *y*); M. discolor (*ter*, *y*, changing to *o*); M. metallica (*ter*, *y* and *pi*); Mormodes atropurpureum (*eph*, *p-br* or *r-br*); M. buccinator (*eph*, *r-br*, dotted); M. Ocanæ (*eph*, *o-y*, spotted *r-br*); M. pardinum (*eph*, *y*, spotted *br*); Oncidium ampliatum

Stove—*continued.*

(*eph*, *y*) and var.; O. barbatum (*eph*, *y* and *br*); O. bicallosum (*eph*, *br*, lip *y*); O. bifolium (*eph*, *g-br* and *y*) and var.; O. Cavendishianum (*eph*, *y*); O. cebolleta (*eph*, *y-r*, spotted); O. Lanceanum (*eph*, *y*, *br*, *v*, *pi*, &c., *sc*) and vars.; O. Papilio (*eph*, *y* and *br*) and vars.; Pachystoma Thomsonianum (*ter*, *w*, *p*, *g*, and *br*); Peristeria elata (*eph*, *w*, spotted *l*, *sc*); P. pendula (*eph*, *y*, spotted *r* and *br*); Phaius tuberculosus (*w*, blotched *br*); Phalænopsis amabilis (*eph*, *w*, streaked *y*); P. amethystina (*eph*, *w*, tinged *y* and *p*); P. Aphrodite (*eph*, *w*, lip *r*, *o*, and *y*); P. Esmeralda (*eph*, *pi*); P. Luddemanniana (*eph*, *w*, *br*, and *v*); P. Parishii (*eph*, *c*, lip *p*); P. Reichenbachiana (*eph*, *w-g*, *br*, *o*, and *mv-b*); P. Sanderiana (*eph*, *pi*, *w*, &c.); P. Schilleriana (*eph*, *pi* and *w*); P. speciosa (*eph*, *w*, *pi*, *pi-p*, and *y*); P. Stuartiana (*eph*, *c*, *g-y*, *br*, and *w*); P. Veitchiana (*eph*, *p* and *p-w*); P. violacea (*eph*, *w*, *v-r*, and *pi*); Renanthera Lowii (*eph*, *g* blotched *r-br*, and *y* marked *r*); Rhynchostylis retusa (*eph*, *w*, striped *v-pi*); Saccolabium acutifolium (*eph*, *y*, lip *pi*); S. Berkeleyi (*eph*, *w* and *b*); S. bigibbum (*eph*, *y* and *w*); S. borneense (*eph*, *br-y*); S. calopterum (*eph*, *p* and *w*); S. cœleste (*eph*, *b*); S. curvifolium (*eph*, *r*); S. giganteum (*eph*, *w*, *b*, and *mv-v*, *sc*) and var.; S. rubrum (*eph*, *pi*); S. Turneri (*eph*, *l* spotted); S. violaceum (*eph*, *w* and *mv*); S. v. Harrisonianum (*eph*, *w*, *sc*); Schomburgkia tibicinis grandiflora (*eph*, *p*, *o*, *w*, *y*, and *r*); S. undulata (*eph*, *br-p* and *v-p*); Scuticaria Steelii (*eph*, *y*, *br-r*, and *o*, *sc*); Sobralia Cattleya (*ter*, *p-br*, *p*, and *y*); S. dichotoma (*ter*, *w*, *v*, &c.); S. rosea (*ter*, *mv* and *r*); Spathoglottis Lobbii (*ter*, *g-y* and *br*); S. pubescens (*ter*, *y*, lip marked *v*); S. rosea (*ter*, *pi*); Stanhopea Bucephalus (*eph*, *y* and *p*, *sc*); S. grandiflora (*eph*, *w*, dotted *r*, *sc*); S. insignis (*eph*, *y*, marked *p*, *sc*); S. oculata (*eph*, *y*, spotted *l* and *br*); S. tigrina (*eph*, *o-y*, blotched *p-br*, *sc*); S. Wardii (*eph*, *y*, dotted *p*, *sc*); Stauropsis Batemanni (*eph*, *y*, *p-r*, *v*, and *pi-p*); S. gigantea (*eph*, *y*, *br*, and *w*); Trichoglottis fasciata (*eph*, *br*, *w*, *y*, and *p*); Trigonidium obtusum (*eph*, *r-y*, *w*, and *pi*); Vanda cærulescens Boxallii (*eph*, *w*, *v*, *l*, and *b*); V. Hookeriana (*eph*, *w*, *pi*, *m*, and *p*); V. insignis (*eph*, *br*, *y-w*, *w*, and *p-pi*); V. lamellata Boxalli (*eph*, *c*, *r-br*, *m-pi*, &c); V. Parishii (*eph*, *g-y*, *m*, *w*, &c., *sc*); E. Roxburghii (*eph*, *g*, *v-p*, *w*, &c.); V. Sanderiana (*eph*, *pi*, *y*, *p-r*, &c.); V. suavis (*eph*, *w*, *p*, and *pi-p*, *sc*); V. teres (*eph*, *w*, *pi-m*, *o*, &c.); V. tricolor (*eph*, *w*, *y*, *pi-m*, &c., *sc*); Warrea tricolor (*ter*, *y-w*, *y*, and *p*); Zygopetalum candidum (*eph*, *w*, *pi-p*, &c.); Z. Dayanum (*eph*, *w*, *p-v*, *y*, *r*, &c.); Z. Gairianum (*eph*, *v*, *p*, *o*, &c.); Z. rostratum (*eph*, *w*, *g*, *br-p*, &c.); Z. triumphans (*eph*, *w* and *b-bk*); Z. Wendlandii (*eph*, *w*, marked *v-p*) and var.

AN INDEX TO CACTI AND OTHER SUCCULENTS.

DURING the last few years Succulents have been far more extensively cultivated than formerly, and seem to be still growing in popular favour—a fact which is not surprising to anyone acquainted with the singularity of appearance of the plants, and the beauty of form and diversity and brilliancy of colour in their flowers. In addition to these attractions Succulent Plants possess the great merit of being remarkably easy of cultivation, while they are capable of enduring with impunity an amount of neglect which would prove fatal to almost any other subjects.

The lists here given comprise the best species in cultivation. The plants are arranged according to their degrees of hardiness, but those classified as hardy will be found to grow much better if a little protection is afforded them in winter. The great majority of Succulents require cool-house treatment; indeed, most of the species grown in stoves would probably thrive in a lower temperature than that to which they are usually subjected.

For general remarks on the culture of these plants, the reader is referred to the article on "Cactus," in Vol. I.

The following are the abbreviations used in the descriptions of the flowers:—

br, brown; *c*, cream; *g*, green; *mv*, mauve; *o*, orange; *p*, purple; *pi*, pink; *r*, red; *sc*, scented; *v*, violet; *w*, white; *y*, yellow.

HARDY.—Agave utahensis (*y*); Cotyledon Sempervivum (*r*); C. spinosa (*y*); C. Umbilicus (*y*); Euphorbia Cyparissias (*y*); E. Myrsinites (*y*); Opuntia Engelmanni (*y*); O. Ficus-Indica (*y*); O. missouriensis (*y*); O. Rafinesquii (*y*); Sedum album (*w*); S. anglicum (*w* or *pi*); S. brevifolium (*w*); S. glaucum (*pi-w*); S. lydium (*pi*); S. pulchellum (*pi-p*); S. reflexum (*y*); Sempervivum arachnoideum (*r*); S. arenarium (*y*); S. atlanticum (*r*); S. Boissieri (*r*); S. Braunii (*r*); S. calcaratum (*r-w*); S. calcareum (*r*); S. fimbriatum (*r*); S. Funckii (*r-p*); S. Heuffelii (*y*); S. Lamottei (*pi*); S. Moggridgei (*r*); S. montanum (*mv-p*); S. Pomellii (*pi-r*); S. soboliferum (*y*); S. Wulfeni (*y*); Yucca filamentosa flaccida (*w*).

COOL-HOUSE.—Adenium obesum (*pi-r*); Agave americana (*y-g*); A. a. picta; A. attenuata (*g-y*); A. Botterii (*g-y*); A. Celsiana (*p-br*); A Corderoyi; A. dasylirioides (*y*); A. Deserti (*y*); A. Elemœtiana (*y-g*); A. filifera (*g*); A. heteracantha (*g*); A. Hookeri (*y*); A. lophantha (*g*); A. macracantha (*g*); A. Maximiliana; A. miradorensis; A. pruinosa; A. Salmiana (*g-y*); A. schidigera (*g*); A. Shawii (*g-y*); A. striata (*br-g* outside, *y* inside); A. Victoriæ Regina; A. virginica (*g-y*); A. Warrelliana; A. xylacantha (*g*); Aloe abyssinica; A. albispina (*r*); A. albocincta (*r*); A. arborescens (*r*); A. Bainesii (*y-r*); A. brevifolia (*r*); A. cæsia (*r*); A. ciliata (*r*); A. Cooperi; A. dichotoma (*r*); A. distans (*r*); A. glauca (*r*); A. Greenii (*r*); A. humilis (*r*); A. latifolia (*y-r*); A. lineata (*r*); A. macrocarpa (*r*); A. mitræformis (*r*); A. nobilis (*r*); A. Perryi (*g*); A. saponaria (*r*); A. Schimperi (*r*); A. serratula (*r*); A. striatula (*y*); A. succotrina (*r*); A. tricolor (*r*); A. variegata (*r*); A. vera (*y*);

Cool-house —*continued.*

Cool-house—*continued.*

Anacampseros arachnoides (*w*); A. rubens (*r*); A. varians (*r*); Apicra aspera; A. bicarinata; A. foliolosa (*g*); A. pentagona (*w*); A. spiralis (*r-w*); Beaucarnea longifolia (*w*); Beschorneria Tonelii (*r* and *g*); Boucerosia maroccana (*r-p*, lined *w*); Bulbine alooides (*y*); B. caulescens (*y*); Cotyledon agavoides (*o*); C. atropurpurea (*r*); C. californica (*y*); C. coccinea (*r*); C. coruscans (*o*); C. fulgens (*r* and *y*); C. gibbiflora metallica (*y*, tipped *r*); C. grandiflora (*r-o*); C. Pachyphytum (*r*); C. Peacockii (*r*); C. Pestalozzæ (*pi*); C. racemosa (*r*); C. retusa (*y*); C. velutina (*y* and *g*); Crassula arborescens (*pi*); C. Bolusii (*w-pi*); C. ciliata (*c*); C. coccinea (*r*); C. Cooperi (*w*); C. falcata (*r* or *w*); C. jasminea (*w*, turning *r*); C. lactea (*w*); C. rosularis (*w*); Dasylirion acrotrichum (*w*); D. glaucophyllum (*w*); Decabelone Barklyi (*y-w*, spotted *r*); Duvalia Corderoyi (*g* or *r-br*); D. polita (*br-p*); Dyckia argentea; Euphorbia atropurpurea (*r-p*); Furcræa longæva (*w*); Gasteria brevifolia (*r*); G. carinata (*r*); G. Croucheri (*w* and *pi*); G. disticha (*r*); G. maculata (*r*); G. pulchra (*r*); G. verrucosa (*r*); Haworthia attenuata; H. cymbiformis; H. retusa; H. rigida; Hoodia Bainii; H. Gordoni; Huernia brevirostris (*y*, *pi-w*, and *r*); H. oculata (*w* and *v-p*); Leuchtenbergia principis (*y*); Mammillaria bicolor (*p*); M. clava (*y*); M. dolichocentra (*pi* or *r*); M. gracilis (*y*); M. Peacockii; M. pectinata (*y*); M. pusilla (*y*); M. sanguinea (*r*); M. stellaaurata (*w*); M. Wildiana (*pi*); Mesembryanthemum blandum (*w*, becoming *pi* or *r*); M. candens (*w*); M. coccineum (*r*); M. conspicuum (*r*); M. Cooperi (*p*); M. cordifolium variegatum (*pi-p*); M. crystallinum (*w*); M. densum (*pi*); M. edule (*y*); M. floribundum (*r*, marked *w*); M. formosum (*p*); M. inclaudens (*p-pi*); M. minutum (*y*); M. multiflorum (*w*); M. purpureo-album (*w*, lined *p*); M. spectabile (*r*); M. tricolorum (*y* and *r*); M. violaceum (*pi-w* to *v*); Opuntia arborescens (*p*); O. Bigelovii; O. braziliensis (*y*); O. cylindrica (*r*); O. Davisii (bronzy *g*); O. echinocarpa (*g-y*); O. microdasys; O. multiflora (*y*); O. Salmiana (*y* and *r*); O. Tuna (*r-o*); O. vulgaris (*g-y*); Othonna crassifolia (*y*); Pelecyphora aselliformis (*w* and *pi*); Pilocereus Dautwitzii; P. Houlletii (*v*); P. senilis; Rhipsalis Cassytha (*g-w*); P. Houlletii (*y*); P. salicornoides (*y*); Rochea odoratissima (*y*, *c-w*, or *pi*, *sc*); Sedum acre aureum (*y*); S. sarmentosum (*y*); Sempervivum aureum (*y*); S. canariense (*w*); S. tabulæforme (*g-y*); Stapelia Asterias (*v*, striped *y*); S. namaquensis (*y*, spotted *p-br*); S. sororia (*p*); Talinum Arnotii (*y*); Trichocaulon piliferum (*y-r* and *p*); Yucca aloifolia (*w*) and vars.

STOVE.—Agave densiflora (*y-r*); A. polyacantha (*g-y*); A. Seemanni; A. univittata (*g*); A. vivipara (*g-y*); A. yuccæfolia (*g-y*); Bryophyllum calycinum (*y-r*); Cereus coccineus (*r*); C. fimbriatus (*pi*); C. flagelliformis (*r* or *pi*); C. grandiflorus (*w*, *y*, and *br*, *sc*); C. Macdonaldiæ (*w*, *r*, and *o*); C. pentagonus (*w*); C. quadrangularis (*w*, *sc*); C. serpentinus (*g*, *p*, and *w*); C. speciosissimus (*r*); Echinocactus pectiniferus (*g* and *pi*); E. Pentlandi (*pi*); E. rhodophthalmus (*pi*); Echinopsis cristata (*c-w*); E. Eyriesii (*w*, *sc*); E. multiplex (*pi*); Epiphyllum truncatum (*r* or *pi*); Euphorbia fulgens (*o-r*); E. meloformis (*g*); E. Monteiri (*g*); E. pulcherrima (*g-y* and *r*); E splendens (*r*); Furcræa Bedinghausii (*g*); F. cubensis (*g*); F. elegans (*g* and *w*); F. gigantea (*w* and *g*); F. undulata (*g*); Kalanchoe grandiflora (*y*); Malacocarpus erinaceus (*y*); Melocactus communis (*pi-r*); Nopalea coccinellifera (*r*); Pereskia aculeata (*w*); P. Bleo (*r*); P. grandifolia (*w*); Phyllocactus Ackermanni (*r*); P. anguliger (*w*, and *o* or *y*, *sc*); P. crenatus (*c-w* and *o*, *sc*); P. latifrons (*c-w* and *r*); P. phyllanthoides (*r* and *w*); Podanthes geminata (*o-y*, dotted *r*); Talinum triangulare (*r* or *w*).

AN INDEX TO PALMS, CYCADS, BAMBOOS, AND SCREW-PINES.

FOR the decoration of glass-houses Palms and Cycads form prominent objects; while for sub-tropical gardening some of the Palms and the Bamboos are indispensable. The lists here given comprise the choicest and most useful species of the Natural Orders *Arundinaceæ, Cycadaceæ, Palmæ,* and *Pandaneæ,* as well as some of the taller specimens of *Gramineæ.* The heights attained by the plants in their native countries are, where known, given in feet. For information on Palms and their uses, and general instructions for their cultivation, the reader is referred to the article on "Palmæ," in Vol. III.

HARDY.—Bambusa Fortunei (1-2) and vars.

HALF-HARDY.—Arundo conspicua (3-12); A. Donax (12); A. D. versicolor (3); Bambusa aurea (6-10); B. striata (6-10); B. violescens; Diplothemium caudescens (10).

COOL-HOUSE.—Bowenia spectabilis; B. s. serrulata; Brahea dulcis; Ceroxylon andicola (50); Chamærops humilis (20); C. macrocarpa; Dioon edule (3); Encephalartos Altensteinii; E. Frederici Guilielmi; E. horridus; E. plumosus; E. villosus; E. v. ampliatus; Jubæa spectabilis (40-60); Livistona chinensis (50); L. Jenkinsiana (10); Macrozamia corallipes; M. Frazeri; M. Perowskiana; M. plumosa; Rhapis flabelliformis; Rhopalostylis Baueri (20); R. sapida (20); Sabal Adansonii; S. Blackburniana (20-25); S. Palmetto (20-40); S. umbraculifera; Trachycarpus excelsus (24); T. Fortunei; Washingtonia filifera (20-40).

INTERMEDIATE HOUSE.—Acrocomia sclerocarpa (40); Bambusa nana (6-8); Microcycas calocoma; Phœnix acaulis (12); P. reclinata (50); P. rupicola (15-20); P. sylvestris (40); P. tenuis; Zamia amplifolia; Z. furfuracea; Z. picta; Z. Wallisii.

STOVE.—Acanthophœnix crinita; Attalea amygdalina; A. Cohune (50); A. excelsa (70); A. speciosa (70); Bactris caryotæfolia (30); B. pallidispina; Bambusa arundinacea (50-60); Borassus flabelliformis (30); Calamus asperrimus; C. ciliaris; C. leptospadix; C. Lewisianus; C. Royleanus; C. spectabilis; C. viminalis (50); Caryota Cumingii (10); C. Rumphiana; C. sobolifera; Catoblastus præmorsus (30-50); Ceratolobus glaucescens; Chamædorea Arenbergiana; C. desmoncoides; C. elegans (4); C. Ernesti-Augusti; C. formosa; C. geonomiformis (4); C. glaucifolia (20); C. graminifolia; C. microphylla; C. Sartorii; C. Wendlandi; Chrysalidocarpus lutescens (30); Cocos plumosa (40-50); C. Romanzoffiana; C. schizophylla (8); C. Weddeliana; Copernicia cerifera; Corypha umbraculifera (100); Cycas circinalis; C. media; C. Normanbyana; C. revoluta (7); Desmoncus granatensis; D. minor; Geonoma Carderi; G. congesta; G. elegans; G. gracilis; G. Martiana; G. Porteana; G. procumbens; G. pumila; G. Schottiana; Guilielma speciosa; Hedyscepe Canterburyana (32); Heterospathe elata; Howea Belmoreana; H. Forsteriana (35); Hyophorbe amaricaulis; H. Verschaffeltii; Iriartea deltoidea; Latania Commersonii (7); L. Loddigesii (10); L. Verschaffeltii (7); Licuala elegans; L. grandis (6); Livistona australis (80); L. humilis (6-30); Loxococcus rupicola (30-40); Martinezia caryotæfolia; M. granatensis; Nephrosperma Van Houtteanum (20-35); Oreodoxa regia; Pandanus Candelabrum variegatus; P. conoideus (14); P. heterocarpus; P. Houlletii; P. minor; P. odoratissimus (20); P. Pancheri; P. utilis (60); P. Vandermeeschii (20); P. Veitchii; Phytelephas macrocarpa (6); Prestoea pubigera (10-12); Pritchardia pacifica (10); P. pericularum; P. Vuylstekiana; Scheela excelsa (40-50); S. unguis; Stevensonia grandiflora (40); Syagrus campestris; S. cocoides (8-10); Synechanthus fibrosus (4); Thrinax multiflora (6-8); T. parviflora (10-12); T. radiata; Veitchia Johannis; Verschaffeltia splendida (80); Wallichia caryotoides; Welfia regia (60).

Stove—*continued.*

AN INDEX TO TREES AND SHRUBS FOR SPECIAL SITUATIONS AND SOILS.

OF the many books that have been written on Dendrology, Forestry, and cognate subjects, some contain list of Trees and Shrubs for particular purposes and positions, but the lists are, as a rule, of the most meagre description. Hence, perhaps, the monotony which is conspicuous in so many of our plantations and shrubberies. The exhaustive classification here presented embraces, in a condensed form, the practical results of the experience of several eminent authorities on the treatment of hardy ligneous plants. By its help, the reader may readily make varied selections of Trees and Shrubs that will thrive in Chalky, Peaty, or Clay Soils, in Marshes and Swamps, on Mountains, in dense Towns and Cities, by the Riverside, or in close proximity to the Sea. A list of the best Trees and Shrubs for the formation of Hedges is also included.

After each name is given abbreviated information as to whether the plant is evergreen (*ev*), nearly or partially so (*s-ev*), or deciduous (*dec*). The figures represent the approximate height in feet.

Much of the so-called waste land which is at present a blot on many an English landscape might, by careful selection and a moderate expenditure of the proprietor's time and money, be converted into woodlands, which would become not only a source of pleasure to himself, but also a valuable legacy to posterity.

CHALKY SOILS.—Calcareous or Chalky Soils are those which contain more than 20 per cent. of Carbonate of Lime. They are variously known as Calcareous Sands, Calcareous Loams, and Calcareous Clays, according to the amount of sand, loam, or clay, that enters into their composition. A large number of trees and shrubs will grow in calcareous soils, as is evidenced by the following list. "There is a prevailing idea that trees *require* a deep soil for their growth; but this is an entire fallacy as regards the greater portion of them. That trees will prosper more in a good deep soil than in a similar soil that is superficial, is no doubt true; but a thin rich soil is better than a deep poor one; and the most fatal mistake that can be

Chalky Soils—*continued.*

made in trenching land preparatory to planting is to throw up a barren subsoil, and bury the better elements beneath it. This is particularly the case on the Chalk lands. That trees of very large size will grow upon the very thin soil may be rendered evident to anyone who travels through the Chalk cuttings on our southern railways. In many places the soil is not 6in. deep above the Chalk, and yet splendid trees, especially Beeches, are seen clothing the hills. . . . . In trenching Chalk land such as I am referring to, the trench should be carried to the bottom of the loam, but no further. However superficial the top soil may be, even 3in. or 4in., it alone should be

Chalky Soils—*continued.*

turned over in the trench, and not a grain of Chalk should be raised. The Chalk may be broken into large lumps with a pickaxe, and left at the bottom of the trench; but there it should remain." (James Salter, F.R.S.)

Abies bracteata (*ev*; 25); A. magnifica (*ev*; 200); A. nobilis (*ev*; 100-300); A. Nordmanniana (*ev*; 80-100); A. pectinata (*ev*; 80-100); A. Pinsapo (*ev*; 60-80); Acer campestre (*dec*; 20); A. dasycarpum (*dec*; 40); A. pennsylvanicum (*dec*; 20); A. platanoides (*dec*; 50) and vars.; A. Pseudo-Platanus (*dec*; 3-60) and vars.; A. rubrum (*dec*; 20); A. saccharinum (*dec*; 40); A. tartaricum (*dec*; 20); Æsculus Hippocastanum (*dec*; 40) and vars.; Ailantus glandulosa (*dec*; 60); Alnus glutinosa (*dec*; 50-60) and vars.; Amelanchier canadensis (*dec*; 6-8) and vars.; Amorpha fruticosa (*dec*; 6) and vars.; Ampelopsis tricuspidata (*dec* climber); Amygdalus communis (*dec*; 10-30) and vars.; Berberis Aquifolium (*ev*; 3-6); B. aristata (*ev*; 6); B. Darwinii (*ev*; 2); B. vulgaris (*dec*; 8-20) and vars.; Betula alba (*dec*; 50-60); Buddleia globosa (*ev*; 15); Bupleurum frutescens (*ev*; 1); Buxus sempervirens (*ev*; 1-30) and vars.; Calycanthus floridus (*dec*; 4-6); Caragana Altagana (*dec*; 2-3); C. arborescens (*dec*; 15-20); C. Chamlagu (*dec*; 2-4); C. spinosa (*dec*; 4-6); Castanea sativa (*dec*; 50-70); Catalpa bignonioides (*dec*; 20-40); Ceanothus americanus (*dec*; 1-3); C. azureus (*ev*; 10); C. dentatus (*dec*; 4-6); C. floribundus (*ev*; 4); C. Veitchianus (*ev*; 3); Cedrus atlantica (*ev*; 80-120); C. Deodara (*ev*; 150-200); Cerasus Avium (*dec*; 20-40) and vars.; C. Laurocerasus (*ev*; 6-10) and vars.; C. lusitanica (*ev*; 10-20); C. Mahaleb (*dec*; 10); C. Padus (*dec*; 10-30); Cercis Siliquastrum (*dec*; 20-30); Chamæcyparis ericoides (*ev*; 3-4); C. Lawsoniana (*ev*; 75-100); C. nutkaensis (*ev*; 40-60); Cistus ladaniferus (*ev*; 4); C. laurifolius (*ev*; 4); C. villosus (*ev*; 3); Clematis Flammula (*dec* climber); C. Jackmanni (*dec* climber); C. Vitalba (*dec* climber); Colutea arborescens (*dec*; 6-10); C. cruenta (*dec*; 4-6); Cornus mas (*dec*; 10-15) and vars.; C. sanguinea (*dec*; 6); C. stolonifera (*dec*; 4-10); Corylus Avellana (*dec*; 20); Cotoneaster buxifolia (*ev*; 3-4); C. microphylla (*ev*; 3-4); C. rotundifolia (*ev*; 3-4); C. Simonsii (*ev*); Cratægus coccinea (*dec*; 20-30) and vars.; C. cordata (*dec*; 20); C. Crus-galli (*dec*; 10-30) and vars.; C. Douglasii (*dec*; 10-15); C. Oxyacantha (*dec*; 10-20) and vars.; C. Pyracantha (*ev*; 10-20); Cupressus macrocarpa (*ev*; 50-60); Cytisus albus (*dec*; 6-10); C. biflorus (*dec*; 3); C. purpureus (*dec*; procumbent); C. Scoparius (*dec*; 3-10); C. sessilifolius (*dec*; 4-6); Deutzia crenata (*dec*; 4-8) and vars.; D. gracilis (*dec*; 1-2); Diervilla grandiflora (*dec*; 8); D. rosea (*dec*; 6); Dimorphanthus mandschuricus (*dec*; 6-10); Escallonia macrantha (*ev*; 3-6); E. Philippiana (*ev*); E. rubra (*ev*; 3-6); Euonymus americanus (*dec*; 2-6); E. europæus (*dec*; 6-20); E. japonicus (*ev*; 20) and vars.; Fagus ferruginea (*dec*; 30); F. sylvatica (*dec*; 60-100); Fraxinus americana (*dec*; 30-40); F. excelsior (*dec*; 30-80) and vars.; F. Ornus (*dec*; 20-30); F. oxyphylla (*dec*; 30-40); Garrya elliptica (*ev*; 8-10); Genista ætnensis (*ev*; 6-15); G. hispanica (*ev*; ½-1); G. radiata (*ev*; 1-3); G. triangularis (*ev*; 2-4); Ginkgo biloba (*dec*; 60-80); Gleditschia sinensis (*dec*; 30-50); G. triacanthos (*dec*; 30-50); Halimodendron argenteum (grafted on Caragana arborescens) (*dec*; 4-6); Hamamelis arborea (*dec*); H. japonica (*dec*); H. virginica (*dec*; 12); Hedera Helix vars. (*ev* climbers); Hypericum calycinum (*s-ev*; 1); Ilex Aquifolium (*ev*; 10-40) and vars.; I. cornuta (*ev*; 15); I. opaca (*ev*; 20-40); Jasminum nudiflorum (*dec* climber); J. officinale (*dec* climber); Juglans cinerea (*dec*; 30-60); J. nigra (*dec*; 60); J. regia (*dec*; 40-60) and vars.; Juniperus chinensis (*ev*; 15-20) and vars.; J. communis (*ev*; 3-20) and vars.; J. Sabina (*ev*; 5-8); J. virginiana (*ev*; 10-15) and vars.; Kerria japonica (*dec*; 3-4); K. j. flore-pleno (*dec*; 3-4); Koelreuteria paniculata (*dec*; 10-15); Laburnum Adami (*dec*); L. alpinum (*dec*; 15-20); L. vulgare (*dec*; 20) and vars.; Larix europæa (*dec*;

Chalky Soils—*continued.*

80-100); L. leptolepis (*dec*; 40); Lavandula vera (*dec*; 1-2); Leycesteria formosa (*dec*; 4-6); Ligustrum japonicum (*ev*; 6-8); L. lucidum (*ev*; 8-12); L. sinense (*ev* or *s-ev*; 18); L. vulgare (*s-ev*; 6-10) and vars.; Lonicera Caprifolium (*dec* twiner); L. flexuosa (*dec* twiner); L. Periclymenum (*dec* climber); L. sempervirens (*ev* climber); Magnolia acuminata (*dec*; 30-60); M. conspicua (*dec*; 20-50); M. glauca (*ev*; 15); M. grandiflora (*ev*; 70-80); M. macrophylla (*dec*; 30); M. Umbrella (*dec*; 35); Morus alba (*dec*; 20-30); M. rubra (*dec*; 14-70); Myricaria germanica (*dec*; 3-6); Negundo aceroides (*dec*; 40) and vars.; Pavia alba (*dec*; 3-9); P. californica (*dec*; 12-40); P. flava (*dec*; 20); Philadelphus coronarius (*dec*; 2-10); P. Gordonianus (*dec*; 10); P. grandiflorus (*dec*; 6-10); Phillyrea latifolia (*ev*; 20-30) and vars.; P. media (*ev*; 10-15) and vars.; Phlomis fruticosa (*ev*; 2-4); Picea excelsa (*ev*; 80-100) and vars.; P. orientalis (*ev*); Pinus austriaca (*ev*; 75-100); P. excelsa (*ev*; 50-150); P. insignis (*ev*; 80-100); P. Laricio (*ev*; 100-150) and vars.; P. Mughus (*ev*; 5-15); P. Pinaster (*ev*; 60-80); P. ponderosa (*ev*; 100-150); P. sylvestris (*ev*; 50-100) and vars.; Populus alba (*dec*; 60-100); P. balsamifera (*dec*; 70) and vars.; P. monilifera (*dec*; 80); P. Tremula pendula (*dec*; 40-80); Prunus spinosa (*dec*; 10-15); Pyrus Aria (*dec*; 4-40); P. Aucuparia (*dec*; 10-30); P. floribunda (*dec*; 8); P. japonica (*dec*; 5-6); P. spectabilis (*dec*; 20-30); P. torminalis (*dec*; 10-50); Quercus Ballota (*ev*; 30); Q. Cerris vars. (*dec* or *s-ev*; 40-60); Q. Esculus (*dec*; 20-30); Q. Ilex (*ev*; 15-60) and vars.; Q. macrocarpa (*dec*; 30); Q. pedunculata (*dec*; 50-100); Q. pseudosuber (*ev*; 50); Q. sessiliflora (*dec*; 60); Q. Suber (*ev*; 25); Q. Toza (*dec*; 20-30); Rhamnus catharticus (*dec*; 5-10); R. Frangula (*dec*; 5-10); Rhus Cotinus (*dec*; 6-8); R. glabra (*dec*; 5-18) and var.; R. typhina (*dec*; 10-30); Ribes alpinum aureum (*dec*; 3); R. aureum (*dec*; 6-8); R. sanguineum (*dec*; 4-8); Robinia Pseudacacia (*dec*; 30-60) and vars.; Rosa canina (*dec*; 6-8); R. repens (*dec*; 2-8); R. rubiginosa (*dec*; 5); R. spinosissima (*dec*; 1-4); R. tomentosa (*dec*; 6); Salix alba (*dec*; 80); S. daphnoides (*dec*; 10-20); S. fragilis (*dec*; 80-90); S. pentandra (*dec*; 6-20); S. purpurea (*dec*; 5-10); S. triandra (*dec*; 20); S. viridis (*dec*; 30); Sequoia gigantea (*ev*; 400); Sparteum junceum (*dec*; 6-10); Spiræa bella (*dec*; 2-3); S. discolor ariæfolia (*dec*; 4-10); S. Lindleyana (*dec*; 4-8); Syringa Emodi (*dec*; 6); S. vulgaris (*dec*; 8-20) and vars.; Tamarix gallica (*dec*; 5-10); Taxus baccata (*ev*; 15-50) and vars.; Tecoma radicans (*dec* climber); Thuya occidentalis (*ev*; 40-50) and vars.; T. orientalis (*ev*; 18-20) and vars.; T. plicata (*ev*; 20); T. tatarica (*ev*; 8-10); Thuyopsis dolabrata (*ev*; 40-50); Tilia argentea (*dec*; 30-50); T. cordata (*dec*); T. platyphyllos (*dec*; 70-80); T. vulgaris (*dec*; 70-80); Torreya taxifolia (*ev*; 40-50); Tsuga canadensis (*ev*; 60-80) and vars.; Ulmus americana (*dec*; 80-100); U. glabra vegeta (*dec*; 60-80); Viburnum Lantana (*dec*; 6-20); V. Opulus (*dec*; 6-8) and vars.; V. Tinus (*ev*; 8-10) and vars.; Yucca filamentosa (*ev*); Y. gloriosa (*ev*; 8-12) and vars.

CLAY SOILS.—Under this heading are enumerated those trees and shrubs which will thrive in an Argillaceous or Clay Soil, *i.e.*, soil which contains some 50 per cent. of Clay. When Clay Soils have been improved by draining, trenching, the admixture of long manure and lime, &c., they become very productive.

Abies nobilis (*ev*; 200-300); A. Nordmanniana (*ev*; 80-100); A. pectinata (*ev*; 80-100); Acer campestre (*dec*; 20); A. dasycarpum (*dec*; 40); A. platanoides (*dec*; 50); A. Pseudo-platanus (*dec*; 30-60); A. tartaricum (*dec*; 20); Æsculus Hippocastanum (*dec*; 40) and vars.; Ailantus glandulosa (*dec*; 60); Alnus cordata; A. glutinosa (*dec*; 50-60) and vars.; Amelanchier canadensis (*dec*; 6-8) and vars.; Amorpha fruticosa (*dec*; 6) and vars.; Ampelopsis tricuspidata (*dec* climber);

Clay Soils—*continued.*

Amygdalus communis (*dec*; 10-30) and vars.; Aucuba japonica (*ev*; 6-10); Berberis Aquifolium (*ev*; 3-6); B. aristata (*ev*; 6); B. Darwinii (*ev*; 2); B. vulgaris (*dec*; 8-20) and vars.; Betula alba (*dec*; 50-60); Buddleia globosa (*ev*; 15); Buxus balearica (*ev*; 15-20); B. sempervirens (*ev*; 1-30) and vars.; Calycanthus floridus (*dec*; 4-6); Caragana Altagana (*dec*; 2-3); C. arborescens (*dec*; 15-20); C. Chamlagu (*dec*; 2-4); C. spinosa (*dec*; 4-6); Carpinus americana (*dec*; 10-50); C. Betula (*dec*; 30-70); Carya alba (*dec*; 50-70); C. amara (*dec*; 50-60); C. tomentosa (*dec*; 60-70); Castanea sativa (*dec*; 50-70); Catalpa bignonioides (*dec*; 20-40); Celtis crassifolia (*dec*; 20-30); C. occidentalis (*dec*; 30-50); Cerasus Avium (*dec*; 20-40) and vars.; C. Laurocerasus (*ev*; 6-10) and vars.; C. lusitanica (*ev*; 10-20); C. Mahaleb (*dec*; 10); C. Padus (*dec*; 10-30); Cercis Siliquastrum (*dec*; 20-30); Chamæcyparis ericoides (*ev*; 3-4); C. Lawsoniana (*ev*; 75-100); C. nutkaensis (*ev*; 40-60); Cladrastus amurensis (*dec*; 6); Clematis Flammula (*dec* climber); C. Jackmanni (*dec* climber); C. Vitalba (*dec* climber); Colutea arborescens (*dec*; 6-10); C. cruenta (*dec*; 4-6); Cornus mas (*dec*; 10-15) and vars.; C. sanguinea (*dec*; 6); C. stolonifera (*dec*; 4-10); Corylus Avellana (*dec*; 20); Cotoneaster buxifolia (*ev*; 3-4); C. microphylla (*ev*; 3-4); C. rotundifolia (*ev*; 3-4); C. Simonsii (*ev*); Cratægus coccinea (*dec*; 20-30) and vars.; C. cordata (*dec*; 20); C. Crus-galli (*dec*; 10-30) and vars.; C. Douglasii (*dec*; 10-15); C. Oxyacantha (*dec*; 10-20) and vars.; C. Pyracantha (*ev*; 10-20); Cytisus albus (*dec*; 6-10); C. biflorus (*dec*; 3); C. purpureus (*dec*; procumbent); C. scoparius (*dec*; 3-10); C. sessilifolius (*dec*; 4-6); Deutzia crenata (*dec*; 4-8) and vars.; D. gracilis (*dec*; 1-2); Diervilla grandiflora (*dec*; 8); D. rosea (*dec*; 6); Euonymus americanus (*dec*; 2-6); E. europæus (*dec*; 6-20); E. japonicus (*ev*; 20) and vars.; Fagus ferruginea (*dec*; 30); F. sylvatica (*dec*; 60-100); Fraxinus americana (*dec*; 30-40); F. excelsa (*dec*; 30-80) and vars.; F. Ornus (*dec*; 20-30); F. oxyphylla (*dec*; 30-40); Garrya elliptica (*ev*; 8-10); Genista ætnensis (*ev*; 6-15); G. hispanica (*ev*; ½ 1); G. radiata (*ev*; 1-3); G. triangularis (*ev*; 2-4); Gleditschia sinensis (*dec*; 30-50); G. triacanthos (*dec*; 30-50); Gymnocladus canadensis (*dec*; 30-60); Halesia hispida (*dec*); H. tetraptera (*dec*; 15-20); Hamamelis arborea (*dec*); H. japonica (*dec*); H. virginica (*dec*; 12); Hedera Helix vars. (*ev* climbers); Hypericum calycinum (*s-ev*; 1); Ilex Aquifolium (*ev*; 10-40) and vars.; I. cornuta (*ev*; 15); I. opaca (*ev*; 20-40); Jasminum nudiflorum (*dec* climber); J. officinale (*dec* climber); Juglans cinerea (*dec*; 30-60); J. nigra (*dec*; 60); J. regia (*dec*; 40-60) and vars.; Juniperus communis hibernica (*ev*); J. recurva (*ev*; 5-8); J. Sabina (*ev*; 5-8); Kerria japonica (*dec*; 3-4); K. j. flore-pleno (*dec*; 3-4); Koelreuteria paniculata (*dec*; 10-15); Laburnum Adami (*dec*); L. alpinum (*dec*; 15-20); L. vulgare (*dec*; 20) and vars.; Larix europæa (*dec*; 80-100); L. leptolepis (*dec*; 40); Lavandula vera (*dec*; 1-2); Leycesteria formosa (*dec*; 4-6); Ligustrum japonicum (*ev*; 6-8); L. lucidum (*ev*; 8-12); L. sinense (*ev* or *s-ev*; 18); L. vulgare (*s-ev*; 6-10); Magnolia acuminata (*dec*; 30-60); M. conspicua (*dec*; 20-50); M. glauca (*ev*; 15); M. grandiflora (*ev*; 70-80); M. macrophylla (*dec*; 30); M. Umbrella (*dec*; 35); Mespilus germanica (*dec*; 10-20); Morus alba (*dec*; 20-30); M. rubra (*dec*; 14-70); Negundo aceroides (*dec*; 40) and vars.; Nemopanthes canadense (*dec*; 3); Osmanthus Aquifolium (*ev*); O. fragrans (*ev*; 6-10); Parrotia persica (*dec*; 10); Pavia alba (*dec*; 3-9); P. californica (*dec*; 12-40); P. flava (*dec*; 20); P. rubra (*dec*; 10); Philadelphus coronarius (*dec*; 2-10); P. Gordonianus (*dec*; 10); P. grandiflorus (*dec*; 6-10); Picea Alcoquiana (*ev*; 90-120); P. excelsa (*ev*; 80-100) and vars.; P. nigra (*ev*; 50-100); P. orientalis (*ev*); P. Smithiana (*ev*; 80-120); Pinus austriaca (*ev*; 75-100); P. excelsa (*ev*; 50-150); P. insignis (*ev*; 80-100); P. Lambertiana (*ev*; 150-300); P. Laricio (*ev*; 100-150); P. Mughus (*ev*; 5-15); P. Pinaster (*ev*; 60-80); P. ponderosa (*ev*; 100-150); P. sylvestris (*ev*; 50-100) and vars.; Platanus occidentalis (*dec*; 70-80); P. orientalis (*dec*; 60-80) and vars.; Populus alba (*dec*; 60-100); P. balsamifera (*dec*; 70) and vars.; P. monilifera (*dec*; 80); P. Tremula pendula (*dec*; 40-80); Pyrus Aria (*dec*; 4-40); P. Aucuparia (*dec*; 10-30); P. floribunda (*dec*; 8); P. japonica (*dec*; 5-6); P. spectabilis (*dec*; 20-30); P. torminalis (*dec*; 10-50); Quercus Ballota (*ev*; 60); Q. Cerris vars. (*dec* or *s-ev*; 40-60); Q. Ilex (*ev*; 15-60) and vars.; Q. pedunculata (*dec*; 50-100); Q. pseudosuber (*ev*; 50); Q. sessiliflora (*dec*; 60); Q. Suber (*ev*; 20-25); Q. Toza (*dec*; 20-30); Rhamnus catharticus (*dec*; 5-10); R. Frangula (*dec*; 5-10); Rhus Cotinus (*dec*; 6-8); R. glabra (*dec*; 5-18) and var.; R. typhina (*dec*; 10-30); Ribes alpinum aureum (*dec*; 3); R. aureum (*dec*; 6-8); R. sanguineum (*dec*; 4-8); Robinia Pseudacacia (*dec*; 30-60) and vars.; Rosa canina (*dec*; 6-8); R. repens (*dec*; 2-8); R. rubiginosa (*dec*; 5); R. spinosissima (*dec*; 1-4); R. tomentosa (*dec*; 6); Salix alba (*dec*; 80); S. daphnoides (*dec*; 10-20); S. fragilis (*dec*; 80-90); S. pentandra (*dec*; 6-20); S. purpurea (*dec*; 5-10); S. triandra (*dec*; 20); S. viridis (*dec*; 30); Sambucus nigra (*dec*; 25); S. racemosa (*dec*; 10-20); Sassafras officinale (*dec*; 15-20); Sequoia gigantea (*ev*; 400); Spartium junceum (*dec*; 6-10); Spiræa bella (*dec*; 2-3); S. discolor ariæfolia (*dec*; 4-10); S. Lindleyana (*dec*; 4-8); Syringa Emodi (*dec*; 6); S. vulgaris (*dec*; 8-20) and vars.; Tamarix gallica (*dec*; 5-10); Taxus baccata (*ev*; 15-50) and vars.; Thuya occidentalis (*ev*; 40-50) and vars.; T. orientalis (*ev*; 18-20) and vars.; T. plicata (*ev*; 20); T. tatarica (*ev*; 8-10); Thuyopsis dolabrata (*ev*; 40-50); Tilia argentea (*dec*; 30-50); T. cordata (*dec*); T. platyphyllos (*dec*; 70-80); T. vulgaris (*dec*; 70-80); Torreya taxifolia (*ev*; 40-50); Tsuga canadensis (*ev*; 60-80) and vars.; Ulmus americana (*dec*; 80-100); U. glabra vegeta (*dec*; 60-80); U. montana (*dec*; 80-100) and vars.; Viburnum Lantana (*dec*; 6-20); V. Opulus (*dec*; 6-8) and vars.; V. Tinus (*ev*; 8-10) and vars.; Xanthoceras sorbifolia (5-15); Yucca filamentosa (*ev*); Y. gloriosa (*ev*; 8-12) and vars.

HEDGES.—Two indispensable qualifications in plants selected for the formation of Hedges are: (1) that they should have dense foliage and closely arranged branchlets, and (2) that they should bear frequent clipping without being materially injured thereby. A select list of trees and shrubs suitable for the purpose is here given. The heights quoted are those attained by the plants under natural conditions. For further instruction the reader is referred to the article on **Hedges**, in Vol. II. Mongredien, in his "Trees and Shrubs for English Plantations," says: "Where a cheap Hedge is wanted, why not try the common Gooseberry? Cuttings (to be had for nothing) strike freely in garden soil, whence, if transplanted the ensuing year to the hedge-bank (provided it be sufficiently wide and flat to catch and retain the moisture from rain), they will rapidly grow into dense, prickly bushes, easily kept in shape by clipping, and never expanding either trunk or roots into such dimensions as to injure the bank on which they are planted." Clipping of Conifers should only be performed when the sap is comparatively quiescent: either in spring, before new growth commences, or in autumn, when the year's growth is completed.

Berberis vulgaris (*dec*; 8-20) and vars.; Buxus sempervirens (*ev*; 1-30); Caragana spinosa (*dec*; 4-6); Carpinus Betulus (*dec*; 30-70); Cerasus Laurocerasus (*ev*; 6-10); Chamæcyparis Lawsoniana (*ev*; 75-100); C. nutkaensis (*ev*; 40-60); C. obtusa (*ev*; 70-100); Cratægus Oxyacantha (*dec*; 10-20) and vars.; Fagus sylvatica (*dec*; 60-100); Hibiscus syriacus (*dec*; 6); Hippophae rhamnoides (*dec*; 2-20); Ilex Aquifolium (*ev*; 10-40) and vars.; Juniperus chinensis (*ev*; 15-20); J. communis (*ev*; 3-20); J. virginiana (*ev*; 10-15) and var. aurea; Laurus nobilis (*ev*; 30-60); Ligustrum ovalifolium (*s-ev*); L. vulgare

Hedges—*continued.*

(*s-ev*; 6-10); Phillyrea angustifolia (*ev*; 8-10); P. latifolia (*ev*; 20-30); P. media (*ev*; 10-15); Prunus cerasifera (*dec*; 20); P. divaricata (*dec*; 10-12); P. spinosa (*dec*; 10-15); Rhamnus Alaternus (*ev*; 20); R. catharticus (*dec*; 5-10); Ribes Grossularia (*dec*; 4); Rosa rubiginosa (*dec*; 5); Rosmarinus officinalis (*ev*; 2-4); Taxus baccata (*ev*; 15-50) and vars.; Thuya occidentalis (*ev*; 40-50); T. orientalis (*ev*; 18-20); T. plicata (*ev*; 20); Viburnum Tinus (*ev*; 8-10).

MARSHES AND BOGS.—The following enumeration of trees and shrubs which are found to thrive in Bogs and other swampy places embraces many which will also grow in tolerably dry soils, and in some cases at considerable elevations. When planting in wet soils, it will be advisable to place some peat, or an admixture of the same, around the roots, in order to give the subjects a fair start.

Abies balsamea (*ev*; 40-60); Acer rubrum (*dec*; 20); Alnus cordifolia (*dec*; 15-50); A. glutinosa (*dec*; 50-60); A. viridis (*dec*); Andromeda polifolia (*ev*; 1); Arbutus Unedo (*ev*; 8-10); Betula lutea (*dec*; 70-80); B. nana (*dec*; 1-3); Bryanthus Gmelini (*ev* trailer); Cassandra angustifolia (*ev*; 1-2); C. calyculata (*ev*; 1-3); Chamæcyparis sphæroidea (*ev*; 40-70); Chionanthus virginica (*dec*; 10-30); Clematis Viorna (*dec* climber); Clethra alnifolia (*dec*; 3-4); C. tomentosa (*dec*; 3-4); Cornus paniculata (*dec*; 4-8); C. sericea (*dec*; 5-8); Dirca palustris (*dec*; 2-5); Erica Tetralix (*ev*; ½-1); Gordonia pubescens (*dec*; 4-6); Hedera Helix vars. (*ev*); Juniperus communis (*ev*; 3-20) and vars; J. virginiana (*ev*; 10-15); Ledum palustre (*ev*; 2); Liquidambar styraciflua (*dec*; 30-50); Myrica cerifera (*ev*; 5-12); M. Gale (*dec*; 2-4); Nemopanthes canadense (*dec*; 3); Nyssa multiflora (*dec*; 30-50); Oxycoccus macrocarpus (*ev* trailer); O. palustris (*ev* trailer); Picea nigra (*ev*; 50-80); Pinus Cembra (*ev*; 50-150); P. contorta (*ev*; 25-30); P. rigida (*ev*; 30-45); P. Strobus (*ev*; 120-160); Platanus orientalis acerifolia (*dec*; 60-80); Populus alba (*dec*; 60-100) and vars.; P. balsamifera (*dec*; 70); P. monilifera (*dec*; 80); P. nigra (*dec*; 50-60) and vars.; P. Tremula (*dec*; 40-80) and vars.; Pyrus arbutifolia (*dec*; 2-10); Quercus aquatica (*dec*; 60-80); Q. lyrata (*dec*; 5); Q. palustris (*dec*; 60); Q. Phellos (*dec*; 50); Q. Prinus (*dec*; 70-90); Rosa lucida (*dec*; 1-2); Rubus Idæus (*dec*; 4-8); Salix alba (*dec*; 80); S. babylonica (*dec*; 30); S. Caprea (*dec*; 15-30); S. daphnoides (*dec*; 10-20); S. pentandra (*dec*; 6-8); S. phylicifolia (*dec*; 10); S. purpurea (*dec*; 5-10); S. rubra Helix (*dec*; 10-12); S. viridis (*dec*; 30); Sambucus canadensis (*dec*; 4-6); S. nigra (*dec*; 25); S. racemosa (*dec*; 10-20); Taxodium distichum; Thuya occidentalis (*ev*; 40-50) and vars.; Viburnum nudus (*dec*; 6-10).

MOUNTAINOUS DISTRICTS.—Careful discrimination is necessary in the choice of trees and shrubs for elevated and exposed positions. Sturdy, well-rooted specimens that have been transplanted, say, two years previously should be selected; and delay in getting them into their permanent quarters should be avoided. The following trees and shrubs will, when once established, thrive at considerable altitudes.

Abies amabilis (*ev*; 180); A. cephalonica (*ev*; 50-60); A. Nordmanniana (*ev*; 80-100); A. pectinata (*ev*; 80-100); A. Pindrow (*ev*; 150); A. subalpina (*ev*; 50-100); A. Veitchii (*ev*; 120-140); Acer montanum (*dec*; 18); A. opulifolium (*dec*; 8); A. platanoides (*dec*; 50); A. Pseudo-platanus (*dec*; 30-60); Arctostaphylos Uva-ursi (*ev* trailer); Aucuba japonica (*ev*; 6-10); Berberis Aquifolium (*ev*; 3-6); B. vulgaris (*dec*; 8-20); Betula alba (*dec*; 50-60) and vars.; B. fruticosa (*dec*; 6 or more); B. nana (*dec*; 1-3); B. pumila (*dec*; 2-3); Buxus sempervirens (*ev*; 1-30) and vars.; Calluna vulgaris (*ev*; 1-3); Caragana pygmæa (1-3); Castanea sativa (*dec*; 50-70); Cedrus Libani (*ev*; 60-80); Cerasus Laurocerasus (*ev*; 6-10); Chamæcyparis

Mountainous Districts—*continued.*

Lawsoniana (*ev*; 75-100); Colutea arborescens (*dec*; 6-10); Corylus Avellana (*dec*; 20); Cotoneaster frigida (*s-ev*; 10); C. nummularia (*s-ev*; 10-15); C. rotundifolia (*ev*; 3-4); C. vulgaris (*dec*; 3-5); Cratægus Oxyacantha (*dec*; 10-20) and vars.; Daphne altaica (*dec*; 1-3); D. Blagayana (*ev*; 1); D. collina (*ev*; 2-3); D. Mezereum (*dec*; 3-4); Diervilla trifida (*dec*; 3-4); Fagus sylvatica (*dec*; 60-100); Hedera Helix vars. (*ev*); Ilex Aquifolium (*ev*; 10-40) and vars.; Juniperus communis (*ev*; 3-20) and vars.; J. nana; J. Sabina (*ev*; 5-8); Kalmia latifolia (*ev*; 3-10); Larix dahurica (*dec*; 30); L. europæa (*dec*; 80-100); L. Ledebourii (*dec*; 80-100); L. leptolepis (*dec*; 2-40); L. occidentalis (*dec*; 150); Leiophyllum buxifolium (*ev*; ½-1); Loiseleuria procumbens (*ev*; procumbent); Philadelphus coronarius (*dec*; 2-10); Phyllodoce taxifolia (*ev*; 2); Picea alba (*ev*; 30-40); P. Englemanni (*ev*; 80-100); P. excelsa (*ev*; 80-100) and vars.; P. Menziesii (*ev*; 50-70); P. nigra (*ev*; 50-80); P. orientalis (*ev*; 80-120); P. Smithiana (*ev*; 80-120); Pinus aristata (*ev*; 40-50); P. austriaca (*ev*; 70-100); P. Balfouriana (*ev*; 40-50); P. Cembra (*ev*; 5-50); P. excelsa (*ev*; 60-150); P. flexilis (*ev*; 5-50); P. Laricio (*ev*; 100-150); P. monophylla (*ev*; 20-25); P. monticola (*ev*; 75-100); P. Mughus (*ev*; 5-15); P. muricata (*ev*; 25-50); P. Pinaster (*ev*; 60-80); P. Strobus (*ev*; 120-160); P. sylvestris (*ev*; 50-100) and vars.; Populus monilifera (*dec*; 80); Potentilla fruticosa (*dec*; 2-4); Pseudotsuga Douglasii (*ev*; 3-150); Pyrus Aria (*dec*; 4-15); P. Aucuparia (*dec*; 10-30); P. Chamæmespilus (*dec*; 5-6); P. Malus (*dec*; 20); Quercus pedunculata (*dec*; 50-100); Q. sessiliflora (*dec*; 60); Rhamnus alpinus (*dec*; 4); R. catharticus (*dec*; 5-10); Ribes sanguineum (*dec*; 4-8); Rosa rubiginosa (*dec*; 5); R. spinosissima (*dec*; 1-4); Rubus biflorus (*dec*); R. fruticosus (*dec*); R. Idæus (*dec*; 4-8); R. spectabilis (*dec*; 6-10); Salix alba (*dec*; 80); Sambucus nigra (*dec*; 25); Spiræa tomentosa (*dec*; 3); Symphoricarpus racemosus (*dec*; 4-6); Syringa vulgaris (*dec*; 8-20); Taxus baccata (*ev*; 15-50) and vars.; Tsuga canadensis (*ev*; 60-80) and vars.; Thuya occidentalis (*ev*; 40-50); T. plicata (*ev*; 20); Ulex europæus (*ev*; 2-3); Ulmus campestris (*dec*; 125); U. montana (*dec*: 80-120).

PEATY SOILS.—Vegetable Earth, or Peat, has already been treated at length in this Dictionary (*see* **Soil,** in Vol. III.). Peaty Soil is best adapted for the reception of most of the trees and shrubs enumerated hereunder: some of them, however, may be equally well accommodated in soils of a widely different description.

Abies balsamea (*ev*; 40-60); A. grandis (*ev*; 100); A. nobilis (*ev*; 200-300); A. Nordmanniana (*ev*; 80-100); A. pectinata (*ev*; 80-100); Acer Pseudo-platanus (*dec*; 30-60); A. tartaricum (*dec*; 20); Alnus glutinosa (*dec*; 50-60); Andromeda polifolia (*ev*; 1); Arbutus Andrachne (*ev*; 10-14); A. Menziesi (*ev*; 6-10); A. Unedo (*ev*; 8-10); Arctostaphylos alpina (*dec* trailer); A. Uva-ursi (*ev* trailer); Asimina triloba (*dec*; 10); Azalea arborescens (*dec*; 10-20); A. calendulacea (*dec*; 2-6); A. hispida (*dec*; 10-15); A. ledifolia (*ev*; 2-6); A. nudiflora (*dec*; 3-4); A. pontica (*dec*; 4-6); A. speciosa (*dec*; 3-4); A. viscosa (*dec*; 2-4); A. varieties; Betula lutea (*dec*; 70-80); Calluna vulgaris (*ev*; 1-3); Calycanthus floridus (*dec*; 4-6); C. glaucus (*dec*; 4-6); C. lævigatus (*dec*; 3-6); C. occidentalis (*dec*; 6-12); Cassandra angustifolia (*ev*; 1-2); C. calyculata (*ev*; 1-3); Cassiope hypnoides (*ev* creeper); C. tetragona (*ev*; ½); Catalpa bignonioides (*dec*; 20-40); Ceanothus americanus (*dec*; 1-3); C. dentatus (*dec*; 4-6); C. floribundus (*ev*; 4); C. Veitchianus (*ev*; 3); Cephalanthus occidentalis (*dec*; 7); Chamæcyparis Lawsoniana (*ev*; 75-100); C. nutkaensis (*ev*; 40-60); C. obtusa (*ev*; 70-100) and vars.; Chionanthus virginica (*dec*; 10-30); Cladrastis amurensis (*dec*; 6); Clethra acuminata (*dec*; 10-15); C. alnifolia (*dec*; 3-4); C. paniculata (*dec*; 3-4); C. tomentosa (*dec*; 3-4); Colutea arborescens (*dec*; 6-10);

Peaty Soils—*continued.*

C. cruenta (*dec*; 4-6); Comptonia asplenifolia (*dec*; 3-4); Corema alba (*ev*; 1); Cornus florida (*dec*; 20-30); Dabœcia polifolia (*ev*; 1-2); Daphne Cneorum (*ev* trailer); D. Gnidium (*ev*; 2); D. pontica (*ev*; 4-5); Desfontainea spinosa (*ev*; 3); Dirca palustris (*dec*; 2-5); Empetrum nigrum (*ev*; ½-1) and var.; Epigæa repens (*ev* creeper); Erica arborea (*ev*; 10-20); E. australis (*ev*; 3-6); E. carnea (*ev*; ½); E. cinerea (*ev*; ½-1); E. codonodes (*ev*; ¾); E. mediterranea (*ev*; 4-6); E. multiflora (*ev*; 2); E. scoparia (*ev*; 2-3); E. Tetralix (*ev*; ½-1); Euonymus americanus (*dec*; 2-6); E. atropurpureus (*dec*; 6-14); E. europæus (*dec*; 6-20); E. japonicus (*ev*; 20) and vars.; Fothergilla alnifolia (*dec*; 3-6) and vars; Gaultheria procumbens (*ev*; procumbent); G. Shallon (*ev*; procumbent); Gordonia lasianthus (*s-ev*; 8-10); G. pubescens (*dec*; 4-6); Halesia hispida (*dec*); H. tetraptera (*dec*; 15-20); Hedera Helix vars. (*ev*); Hydrangea arborescens (*dec*; 4-6); Itea virginica (*dec*; 6-7); Juniperus communis (*ev*; 3-20) and vars.; J. recurva (*ev*; 5-8); J. Sabina (*ev*; 5-8); Kalmia angustifolia (*ev*; 2-3); K. latifolia (*ev*; 3-10); Kerria japonica (*dec*; 3-4) and var.; Koelreuteria paniculata (*dec*; 10-15); Laburnum Adami (*dec*); L. alpinum (*dec*; 15-20); L. vulgare (*dec*; 20) and vars.; Laurus nobilis (*ev*; 30-60); Ledum latifolium (*ev*; 1-2); L. palustre (*ev*; 2); Leiophyllum buxifolium (*ev*; ½-1); Leucothoe axillaris (*ev*; 2-3); L. Davisiæ (*ev*; 3-5); L. racemosa (*ev*; 4-10); Ligustrum japonicum (*ev*; 6-8); L. lucidum (*ev*; 8-12); L. Massalongeanum (*ev*; 6); L. ovalifolium (*s-ev*; 6) and vars.; Lindera Benzoin (*ev*; 6-15); Lyonia ligustrina (*ev*; 3-10); Magnolia conspicua (*dec*; 30-50); M. glauca (*ev*; 15); M. stellata (*dec*); Menispermum canadense (*dec* climber); Menziesia ferruginea globularis (*ev*; 2-5); Mespilus germanica (*dec*; 10-20); M. Smithii (*dec*; 20); Myrica californica (*ev*; 30-40); M. cerifera (*ev*; 5-12); M. Gale (*dec*; 2-4); Negundo aceroides (*dec*; 40) and vars.; Neillia opulifolia (*dec*; 5); Nuttallia cerasiformis (*dec*; 5); Olearia Haastii (*ev*); Ostrya carpinifolia (*dec*; 30-40); O. virginica (*dec*; 15-40); Oxycoccus macrocarpus (*ev* trailer); Periploca græca (*dec* climber); Pernettya furens (*ev*; 3); P. mucronata (*ev*; 6); Philadelphus coronarius (*dec*; 2-10) and vars.; P. Gordonianus (*dec*; 10); P. grandiflorus (*dec*; 6-10); P. hirsutus (*dec*; 3); P. inodorus (*dec*; 4-6); Phillyrea media (*ev*; 10-15); P. Vilmoriniana (*ev*); Phyllodoce taxifolia (*ev*; 2); Picea Alcoquiana (*ev*; 90-120); P. excelsa (*ev*; 100) and vars.; P. nigra (*ev*; 50-100); P. orientalis (*ev*); P. Smithiana (*ev*; 80-120); Pinus Lambertiana (*ev*; 150-300); P. Laricio (*ev*; 100-150); P. sylvestris (*ev*; 50-100); Polygala Chamæbuxus (*ev*; ½); Pyrus Aucuparia (*dec*; 10-30); Quercus alba (*dec*; 60); Q. rubra (*dec*; 80-90); Rhamnus Frangula (*dec*; 5-10); Rhododendron albiflorum (*ev*; 2-3); R. Anthopogon (*ev*; 1-1½); R. catawbiense (*ev*; 3-6); R. caucasicum (*ev*; 1); R. ciliatum (*ev*; 2); R. dahuricum (*ev*; 3); R. Farreræ (*ev*; 3); R. ferrugineum (*ev*; 1); R. Fortunei (*ev*; 12); R. hirsutum (*ev*; 1-2); R. ponticum (*ev*; 6-12); R. varieties (*ev*); Rhodora canadensis (*dec*; 2-4); Rhodothamnus Chamæcistus (*ev*; ½); Rhodotypos kerrioides (*ev*; 15); Sambucus nigra (*dec*; 25) and vars.; S. racemosa (*dec*; 10-20); Sciadopitys verticillata (*ev*; 80-120); Skimmia japonica (*ev*; 3-4); S. Laureola (*ev*; 4); S. oblata (*ev*); S. rubella (*ev*); Solanum Dulcamara (*dec* trailer); Spartium junceum (*dec*; 6-10); Spiræa bella (*dec*; 2-3); S. cantoniensis (*ev*; 3-4); S. chamædrifolia (*dec*; 1-2); S. discolor ariæfolia (*dec*; 4-10); S. lævigata (*dec*; 1-3); S. Lindleyana (*dec*; 4-8); S. prunifolia flore-pleno (*dec*; 3); S. salicifolia (*dec*; 3-5) and vars.; S. Thunbergi (*dec*; 1-3); S. trilobata (*dec*; 1-2); Staphylea colchica (*dec*; 3-5); S. pinnata (*dec*; 6-12); S. trifolia (*dec*; 6-12); Stephanandra flexuosa (*dec*); Stuartia pentagyna (*dec*; 10); S. virginica (*dec*; 8); Syringa Emodi (*dec*; 6); S. japonica (*dec*); S. vulgaris (*dec*; 8-20) and vars.; Tamarix gallica (*ev*; 5-10); Taxus baccata (*ev*; 15-50) and vars.; T. cuspidata (*ev*; 15-20); Thuya gigantea (*ev*; 50-150); T. occidentalis (*ev*; 40-50) and vars.; T. orientalis (*ev*; 18-20) and vars.; Thuyopsis dolabrata (*ev*; 40-50); Ulex europæus (*ev*; 2-3); U. nanus (*ev*; 1-3); Vaccinium corymbosum (*dec*; 5-10); V. formosum (*dec*; 2-3); V. Myrsinites (*ev*; ¾-2); V. pennsylvanicum (*dec*; ¾-1); V. stamineum (*dec*; 2-3); V. Vitis-Idæa (*ev*; procumbent); Viburnum dentatum (*dec*; 5-10); V. dilatatum (*dec*; 10); V. Lentago (*dec*; 15-30); V. macrocephalum (*dec*; 20) and var.; V. Opulus (*dec*; 6-8) and vars.; V. plicatum (*dec*; 4-6) and var.; V. prunifolium (*dec*; 8-10); V. Tinus (*ev*; 8-10) and vars.; Wistaria chinensis (*dec* climber) and vars.; W. japonica (*dec* twiner); Xanthoceras sorbifolia (5-15); Xanthorrhiza apiifolia (*dec*; 1-3); Zenobia speciosa (*ev*; 2-4) and var.

SANDY SOILS.—Many of our ornamental and useful trees and shrubs require a light, Sandy Soil which affords a ready means of ingress to both air and water, and which prevents the accumulation of stagnant moisture about the roots. A list of trees and shrubs which thrive well in such soils is here given.

Acer campestre (*dec*; 20); A. macrophyllum (*dec*; 60); A. platanoides (*dec*; 50); A. Pseudo-platanus (*dec*; 30-60); A. rubrum (*dec*; 20); A. tataricum (*dec*; 20); Æsculus glabra (*dec*; 20); Æ. Hippocastanum (*dec*; 50-60); Æ. rubicunda (*dec*; 20); Alnus cordifolia (*dec*; 15-50); Aristolochia Sipho (*dec* climber); Artemisia Abrotanum (*dec*; 2-4); Berberis Aquifolium (*ev*; 3-6); B. Darwinii (*ev*; 2); B. empetrifolia (*ev*; 1½-2); B. vulgaris (*dec*; 8-20) and vars.; Betula alba (*dec*; 50-60) and vars.; B. nigra (*dec*; 60-70); B. pumila (*dec*; 2-3); Broussonetia papyrifera (*dec*; 10-20); Buxus sempervirens (*ev*; 12-15); Calluna vulgaris (*ev*; 1-3); Caragana Altagana (*dec*; 2-3); C. spinosa (*dec*; 4-6); Carya alba (*dec*; 50-70); C. amara (*dec*; 50-60); C. tomentosa (*dec*; 60-70); Castanea sativa (*dec*; 50-70) and vars.; Catalpa bignonioides (*dec*; 20-40); Ceanothus americanus (*dec*; 1-3); C. dentatus (*dec*; 4-6); C. floribundus (*ev*; 4); C. Veitchianus (*ev*; 3); Cedrus Libani (*ev*; 60-80); Celtis crassifolia (*dec*; 20-30); C. occidentalis (*dec*; 30-50); Cerasus Avium (*dec*; 20-40); C. depressa (*dec*; 1); C. Laurocerasus (*ev*; 6-10); C. Mahaleb (*dec*; 10); C. Padus (*dec*; 10-30); Cercis canadensis (*dec*; 12-20); C. Siliquastrum (*dec*; 20-30); Chamæcyparis nutkaensis (*ev*; 40-60); C. obtusa (*ev*; (70-100) and vars.; Cladrastis amurensis (*dec*; 6); Colutea arborescens (*dec*; 6-10); C. cruenta (*dec*; 4-6); Corylus Avellana (*dec*; 20); Cratægus Oxyacantha (*dec*; 10-20) and vars.; Cryptomeria japonica (*ev*; 50-100); Cupressus Goveniana (*ev*; 15-20); C. macrocarpa (*ev*; 50-60); C. sempervirens (*ev*; 6-100); C. torulosa (*ev*; 50-70); Cytisus albus (*dec*; 6-10); C. biflorus (*dec*; 3); C. purpureus (*dec*); C. scoparius (*dec*; 3-10); Diospyros virginiana (*ev*; 20-30); Elæagnus hortensis (*dec*; 15-20); E. longipes (*ev*; 3); E. macrophylla (6); E. pungens (6); Euonymus americanus (*dec*; 2-6); E. atropurpureus (*dec*; 6-14); E. europæus (*dec*; 6-20); E. japonicus (*ev*; 20) and vars.; Fagus ferruginea (*dec*); F. sylvatica (*dec*; 60-100); Fontanesia Fortunei (*s-ev*); F. phillyræoides (*s-ev*; 10-14); Forsythia suspensa (*dec*); F. viridissima (*dec*; 10); Fothergilla alnifolia (*dec*; 3-6); Fraxinus americana (*dec*; 30-40); F. excelsior (*dec*; 30-80); F. Ornus (*dec*; 20-30); Fremontia californica (*dec*; 6-10); Genista anglica (1-2); G. pilosa (*ev* procumbent); G. tinctoria (*ev*; 1-2); Ginkgo biloba (*dec*; 60-80); Gleditschia sinensis (*dec*; 30-50); G. triacanthos (*dec*; 30-50); Gymnocladus canadensis (*dec*; 30-60); Halesia hispida (*dec*); H. tetraptera (*dec*; 15-20); Hamamelis arborea (*dec*; 15-20); H. virginica (*dec*; 20); Hedera Helix vars. (*ev* climbers); Hibiscus syriacus (*dec*; 6) and vars.; Hypericum calycinum (*s-ev*; 1); H. elatum (*dec*; 5); H. hircinum (*dec*; 2-4); H. Kalmianum (*dec*; 2-4); H. patulum (*ev*; 6); Idesia polycarpa; Ilex Aquifolium (*ev*; 10-40) and vars.; I. cornuta (*ev*); I. latifolia (*ev*; 20); I.

Sandy Soils—*continued.*

opaca (*ev*; 20-40); Juglans cinerea (*dec*; 30-60); J. nigra (*dec*; 60); J. regia (*dec*; 40-60) and vars.; Juniperus chinensis (*ev*; 15-20) and vars.; J. communis (*ev*; 3-20) and vars.; J. excelsa (*ev*; 20-40) and var.; J. phœnicea (*ev*; 15-18); J. procumbens (*ev*; procumbent); J. Sabina (*ev*; 5-8) and vars.; J. thurifera (*ev*; 15-25); J. virginiana (*ev*; 10-15) and vars.; Kerria japonica (*dec*; 3-4) and var.; Koelreuteria paniculata (*dec*; 10-15); Laburnum Adami (*dec*); L. alpinum (*dec*; 15-20); L. vulgare (*dec*; 20) and vars.; Larix europæa (*dec*; 80-100); Laurus nobilis (*ev*; 30-60); Lavandula vera (*dec*; 1-2); Leiophyllum buxifolium (*ev*; ½-1); Ligustrum japonicum (*ev*; 6-8); L. lucidum (*ev*; 8-12); L. Massalongeanum (*ev*; 6); L. ovalifolium (*s-ev*; 6) and vars.; L. vulgare (*s-ev*; 6-10); Lycium afrum (*dec*; 6-10); L. barbarum (*dec* climber); L. europæum (*dec*; 10-12); Magnolia acuminata (*dec*; 30-60); M. conspicua (*dec*; 30-50); M. grandiflora (*ev*; 70-80); M. macrophylla (*dec*; 30); M. parviflora (*dec*); M. stellata (*dec*); M. Umbrella (*dec*; 35); Morus alba (*dec*; 20-30); M. nigra (*dec*; 20-30); M. rubra (*dec*; 40-70); Muehlenbeckia complexa (*ev* climber); Myrica californica (*ev*; 30-40); M. cerifera (*ev*; 5-12); Myricaria germanica (*dec*; 3-6); Negundo aceroides (*dec*; 40) and vars.; Neillia opulifolia (*dec*; 5); Nuttallia cerasiformis (*dec*; 5); Olearia Haastii (*ev*); Ononis fruticosa (*dec*; 1-2); Osmanthus Aquifolium (*ev*); O. fragrans (*ev*; 6-10); Ostrya carpinifolia (*dec*; 30-40); O. virginica (*dec*; 15-40); Pavia alba (*dec*; 3-9); P. californica (*dec*; 12-40); P. flava (*dec*; 20); P. rubra (*dec*; 6-10); Periploca græca (*dec* climber); Petteria ramentacea (*dec*; 15); Philadelphus coronarius (*dec*; 2-10) and vars.; P. Gordonianus (*dec*; 10); P. grandiflorus (*dec*; 6-10); P. hirsutus (*dec*; 3); P. inodorus (*dec*; 4-6); Phlomis fruticosa (*ev*; 2-4); Photinia serrulata (*ev*; 10-20); Picea Alcoquiana (*ev*; 90-120); Pinus austriaca (*ev*; 75-100); P. Cembra (*ev*; 50-150); P. excelsa (*ev*; 50-150); P. halepensis (*ev*; 40-50); P. Lambertiana (*ev*; 150-300); P. Laricio (*ev*; 100-150); P. monophylla (*ev*; 20-25); P. Mughus (*ev*; 5-15); P. Pinaster (*ev*; 60-80); P. Pinea (*ev*; 50-60); P. ponderosa (*ev*; 100-150); P. pyrenaica (*ev*; 60-80); P. rigida (*ev*; 30-45); P. Strobus (*ev*; 120-160); P. sylvestris (*ev*; 50-100); Podocarpus andina (*ev*; 40-50); P. Nageia (*ev*; 30-60); Pseudolarix Kæmpferi (*dec*; 120-130); Purshia tridentata (*ev*; 2-3); Pyrus arbutifolia (*dec*; 2-10); P. Aria (*dec*; 4-40); P. Aucuparia (*dec*; 10-30); P. baccata (*dec*; 15-20); P. communis (*dec*; 20-40); P. coronaria (*dec*; 20); P. domestica (*dec*; 20-60); P. floribunda (*dec*); P. Malus vars. (*dec*; 20); P. spectabilis (*dec*; 20-30); P. Toringo (*dec*); Quercus alba (*dec*; 60); Q. Catesbæi (*dec*; 15-30); Q. Cerris (*dec*; 40-60) and vars.; Q. coccinea (*dec*; 50); Q. Ilex (*ev*; 15-60) and vars.; Q. ilicifolia (*dec*; 3-8); Q. nigra (*dec*; 8-25); Q. Suber (*ev*; 25); Q. tinctoria (*dec*; 80-100); Q. Toza (*dec*; 20-30); Rhamnus Alaternus (*ev*; 20); R. Frangula (*dec*; 5-10); Rhus Cotinus (*dec*; 6-8); R. typhina (*dec*; 10-30); Ribes aureum (*dec*; 6-8); R. floridum (*dec*; 4); R. gracile (*dec*; 4-5); R. Grossularia (*dec*; 4); R. nigrum (*dec*; 5); R. oxyacanthoides (*dec*; 2-3); R. rubrum (*dec*; 4); R. sanguineum (*dec*; 4-8); R. speciosum (*dec*; 4-6); Robinia hispida (*dec*; 3-8); R. Pseudacacia (*dec*; 30-60) and vars.; R. viscosa (*dec*; 20-40); Rosa canina (*dec*; 6-8); R. repens (*dec*; 2-8); R. rubiginosa (*dec*; 5); R. spinosissima (*dec*; 1-4); R. tomentosa (*dec*; 6); Rosmarinus officinalis (*ev*; 2-4); Rubus fruticosus (*dec* trailer); Ruscus aculeatus (*ev*; 1-2); R. Hypophyllum (*ev*; 1-1½); R. racemosus (*ev*; 4); Santolina Chamæcyparissus (*ev*; 1-2); Sassafras officinale (*dec*; 15-20); Sequoia gigantea (*ev*; 300-400) and vars.; S. sempervirens (*ev*; 200-300) and vars.; Smilax aspera (*ev* climber); S. rotundifolia (*ev* climber); Sophora japonica (*dec*; 30-40) and vars.; Spartium junceum (*dec*; 6-10); Spiræa bella (*dec*; 2-3); S. cantoniensis (*ev*; 3-4); S. chamædrifolia (*dec*; 1-2); S. discolor ariæfolia (*dec*; 4-10); S. lævigata (*dec*; 1-3); S. Lindleyana (*dec*; 4-8); S. prunifolia flore-

Sandy Soils—*continued.*

pleno (*dec*; 3); S. salicifolia (*dec*; 3-5) and vars.; S. trilobata (*dec*; 1-2); Staphylea colchica (*dec*; 3-5); S. pinnata (*dec*; 6-12); S. trifolia (*dec*; 6-12); Stauntonia hexaphylla (*ev*); Stephanandra flexuosa (*dec*); Styrax grandifolia (*dec*; 6); S. serrulata (*dec*; 40); Symphoricarpus occidentalis (*dec*); S. racemosus (*dec*; 4-6); S. vulgaris (*dec*; 3-6); Syringa Emodi (*dec*; 6); S. japonica (*dec*); S. vulgaris (*dec*; 8-20) and vars.; Tamarix gallica (*ev*; 5-10); Ulex europæus (*ev*; 2-3); U. nanus (*ev*; 1-3); Ulmus campestris (*dec*; 125) and vars.; Viburnum dentatum (*dec*; 5-10); V. dilatatum (*dec*; 10); V. Lentago (*dec*; 15-30); V. macrocephalum (*dec*; 20) and var.; V. Opulus (*dec*; 6-8) and vars.; V. plicatum (*dec*; 4-6) and var.; V. prunifolium (*dec*; 8-10); V. Tinus (*ev*; 8-10) and vars.; Xanthoceras sorbifolia (5-15); Xanthorrhiza apiifolia (*dec*; 1-3); Yucca aloifolia (*ev*; 15-20); Y. angustifolia (*ev*; 4-5); Y. filamentosa vars. (*ev*); Y. gloriosa (*ev*; 4-6) and vars.

SEASIDE.—Plants suitable for cultivation on the Seacoast have been briefly dealt with in the Dictionary, under the title **Seaside Grounds and Plants,** in Vol. III. All the trees and shrubs here named will thrive in close proximity to the sea; but some of them require protection from rough winds in very exposed situations. "The best sheltering nurses amongst deciduous trees are the Sallow, Alder, Osier, and Birch, and among evergreens the Scotch Pine; but as these nurses would be gladly accepted in many instances as permanent occupants, I would earnestly recommend them as particularly fitted for such situations." (Grigor's "Arboriculture.") Such subjects as require to be partially sheltered from the sea-breeze are denoted by an asterisk.

Abies concolor* (*ev*; 80-150); A. nobilis* (*ev*; 100-300); A. pectinata* (*ev*; 80-100); A. Pinsapo* (*ev*; 60-80); Acer creticum (*s-ev*; 4); A. monspessulanum (*dec*; 10-20); A. platanoides* (*dec*; 50); A. Pseudo-platanus (*dec*; 30-60); Ailantus glandulosa (*dec*; 60); Alnus glutinosa (*dec*; 50-60) and vars.; Araucaria imbricata* (*ev*; 50-100); Arbutus Andrachne* (*ev*; 10-14); A. Menziesi* (*ev*; 6-10); A. Unedo* (*ev*; 8-10); Aucuba japonica* (*ev*; 6-10) and vars.; Azalea pontica* (*dec*; 4-6); Baccharis halimifolia (*dec*; 6-12); Berberis Aquifolium (*ev*; 3-6); B. Darwinii (*ev*; 2); B. empetrifolia (*ev*; 1½-2); B. vulgaris (*dec*; 8-20) and vars.; Betula alba (*dec*; 50-60) and vars.; Buddleia globosa* (*ev*; 15); Bupleurum frutescens (*ev*; 1); Buxus balearica* (*ev*; 15-20); B. sempervirens* (*ev*; 1-30) and vars.; Carpinus Betulus (*dec*; 30-70); Ceanothus americanus (*dec*; 1-3); Cerasus Avium* (*dec*; 20-40); C. Laurocerasus* (*ev*; 6-10); C. lusitanica* (*ev*; 10-20); C. Padus (*dec*; 10-30); Chamæcyparis Lawsoniana (*ev*; 75-100); C. nutkaensis (*ev*; 40-60); Cistus ladaniferus (*ev*; 4); C. laurifolius (*ev*; 4); C. villosus (*ev*; 3); Clematis Flammula (*dec* climber); C. Vitalba (*dec* climber); Colutea arborescens* (*dec*; 6-10); Cornus sanguinea* (*dec*; 6); Coronilla Emerus (*dec*; 3-4); Corylus Avellana (*dec*; 20) and vars.; Cotoneaster microphylla (*ev*; 3-4); C. vulgaris (*dec*; 3-5); Cratægus Oxyacantha (*dec*; 10-20) and vars.; C. Pyracantha (*ev*; 10-20); Cupressus macrocarpa* (*ev*; 50-60); Cytisus albus* (*dec*; 6-10); C. scoparius (*dec*; 3-10); Daphne Cneorum (*ev* trailer); D. Laureola* (*ev*; 3-4); D. pontica (*ev*; 4-5); Desfontainea spinosa* (*ev*; 3); Deutzia crenata* (*dec*; 4-8); Diervilla grandiflora* (*dec*; 8); D. rosea* (*dec*; 6); Elæagnus hortensis (*dec*; 15-20); E. longipes (*ev*; 3); E. macrophylla (6); E. pungens (6); Ephedra vulgaris (*ev*; 1-2); Escallonia macrantha (*ev*; 3-6); Euonymus japonicus (*ev*; 20) and vars.; Fagus sylvatica (*dec*; 60-100); Ficus Carica* (*dec*; 15-30); Fraxinus excelsior (*dec*; 30-80) and vars.; Garrya elliptica* (*ev*; 8-10); Griselinia littoralis* (*ev*; 30); G. lucida* (*ev*); Halimodendron argenteum (*dec*; 4-6); Hedera Helix vars. (*ev* climbers); Hippophae rhamnoides (*dec*; 2-20); Hydrangea hortensis* (*dec*; 2-3) and vars.; Ilex Aquifolium (*ev*; 10-40) and

Sandy Soils—*continued.*

vars.; Juniperus communis (*ev*; 3-20); Laburnum alpinum (*dec*; 15-20); L. vulgare (*dec*; 20); Laurus nobilis* (*ev*; 30-60); Lavandula vera (*dec*; 1-2); Leycesteria formosa (*dec*; 4-6); Ligustrum ovalifolium (*s-ev*; 6) and vars.; L vulgare (*s-ev*; 6-10); Lonicera Periclymenum (*dec* climber); Lycium europæum (*dec*; 10-12); Myricaria germanica (*dec*; 3-6); Myrtus communis* (*ev*; 3-10); Philadelphus coronarius* (*dec*; 2-10); Phillyrea angustifolia* (*ev*; 8-10); P. latifolia* (*ev*; 20-30); P. media* (*ev*; 10-15); Picea Menziesii* (*ev*; 50-70); P. orientalis* (*ev*; 80-120); Pinus australis* (*ev*; 60-70); P. austriaca (*ev*; 75-100); P. Cembra (*ev*; 50-150); P. Coulteri (*ev*; 50-70); P. insignis (*ev*; 80-100); P. koraiensis (*ev*; 20-30); P. Laricio (*ev*; 100-150); P. Massoniana (*ev*; 70-80); P. Mughus (*ev*; 5-15); P. Pinaster (*ev*; 60-80); P. Pinea (*ev*; 50-60); P. Sabiniana (*ev*; 40-60); P. Strobus (*ev*; 120-160); Platanus orientalis (*dec*; 60-80); Populus alba* (*dec*; 60-100); P. nigra* (*dec*; 50-60); P. Tremula* (*dec*; 40-80); Prunus maritima (*dec*; 2-3); Pyrus arbutifolia (*dec*; 2-10); P. Aria (*dec*; 4-40); P. Aucuparia (*dec*; 10-30); P. baccata (*dec*; 15-20); P. communis (*dec*; 20-40); P. coronaria (*dec*; 20); P. domestica (*dec*; 20-60); P. floribunda (*dec*); P. prunifolia (*dec*; 20-30); Quercus Ilex (*ev*; 15-60) and vars.; Q. pedunculata (*dec*; 50-100); Q. Phellos (*dec*; 50); Q. sessiliflora (*dec*; 60); Q. Suber (*ev*; 25); Rhamnus Alaternus (*dec*; 20); R. catharticus (*dec*; 5-10); Rhododendron catawbiense (*ev*; 3-6); R. ponticum (*ev*; 6-12); R. hybrids and alpine vars.* (*ev*); Ribes sanguineum (*dec*; 4-8); Rosa rubiginosa (*dec*; 5); R. rugosa (*dec*; 4); R. spinosissima (*dec*; 1-4); Salix alba (*dec*; 80); S. Caprea (*dec*; 15-30); S. viminalis (*dec*; 30); Sambucus nigra (*dec*; 25) and vars.; Shepherdia argentea (*dec*; 12-18); Spartium junceum* (*dec*; 6-10); Spiræa Douglasii* (*dec*; 3); S. japonica* (*ev*; 4-6); S. Lindleyana* (*dec*; 4-8); S. trilobata* (*dec*; 1-2); Symphoricarpus racemosus (*dec*; 4-6); Syringa persica* (*dec*; 4-5); S. vulgaris* (*dec*; 8-20); Tamarix gallica (*ev*; 5-10); Taxus baccata* (*ev*; 15-50) and vars.; Thuya occidentalis* (*ev*; 40-50) and vars.; Ulex europæus (*ev*; 2-3) and vars.; Ulmus montana (*dec*; 80-120) and vars.; Viburnum Opulus sterile* (*dec*; 6-8); V. Tinus* (*ev*; 8-10); Yucca angustifolia (*ev*; 4-5); Y. filamentosa vars. (*ev*); Y. gloriosa (*ev*; 4-6) and vars.

TOWNS.—A selection of the trees and shrubs best calculated to withstand the smoke and chemical impurities of atmosphere which abound in most large manufacturing Towns, is here given. Those which come in leaf late, *e.g.*, Elms, Willows, Poplars, Laburnums, Alders, &c., are best suited to the purpose, as they do not suffer so much from the smoke given off by the domestic fires in winter and early spring. The asterisks indicate those trees and shrubs which are better adapted for Towns in the midland and southern districts than for those in the north. Very few of the Conifers will survive the effects of the atmosphere of a densely populated Town.

Acer macrophyllum (*dec*; 60); A. platanoides (*dec*; 50); A. Pseudo-platanus (*dec*; 30-60); Æsculus Hippocastanum (*dec*; 50-60); Ailantus glandulosa* (*dec*; 60); Alnus glutinosa (*dec*; 50-60); Amelanchier canadensis (*dec*; 6-8); Ampelopsis quinquefolia (*dec* creeper); A. tricuspidata (*dec* climber); Amygdalus communis* (*dec*; 10-30); Arbutus Andrachne* (*ev*; 10-14) and var.; A. Unedo* (*ev*; 8-10); Artemisia Abrotanum (*dec*; 2-4); Aucuba himalaica (*ev*); A. japonica (*ev*; 6-10) and vars.; Berberis Aquifolium (*ev*; 3-6); B. Darwinii (*ev*; 2); B. empetrifolia (*ev*; 1½-2); B. vulgaris (*dec*; 8-20); Betula alba (*dec*; 50-60) and vars.; Buddleia globosa (*ev*; 15); Buxus sempervirens (*ev*; 1-30) and vars.; Calluna vulgaris (*ev*; 1-3) and vars.; Caragana arborescens (*dec*; 15-20); Castanea sativa (*dec*; 50-70); Cerasus Avium (*dec*; 20-40); C. Laurocerasus colchica (*ev*; 6-10); C. lusitanica (*ev*; 10-20); C. Padus (*dec*; 10-30); Cercis Siliquastrum* (*dec*; 20-30); Chimonanthus fragrans (*dec*; 6-8); Clematis Flammula (*dec* climber); C. Vitalba (*dec* climber); C. varieties (*dec* climbers); Colutea arborescens (*dec*; 6-10); C. cruenta (*dec*; 4-6); Cornus mas (*dec*; 10-15) and vars.; C. sanguinea (*dec*; 6); Cotoneaster microphylla (*ev*; 3-4); C. Simonsii (*ev*); Cratægus Crus-galli (*dec*; 10-20) and vars.; C. flava (*dec*; 12-20); C. heterophylla (*dec*; 10-20); C. orientalis (*dec*; 12-20); C. Oxyacantha (*dec*; 10-20) and vars.; C. Pyracantha (*ev*; 10-20); C. tanacetifolia (*dec*; 12-20); Cydonia Maulei* (*dec*); C. vulgaris* (*dec*; 20) and vars.; Cytisus albus (*dec*; 6-10); Daphne Mezereum (*dec*; 3-4); Diervilla rosea* (*dec*; 6); Erica carnea (*ev*; ½); E. multiflora (*ev*; 2); E. vagans (*ev*; 1); Euonymus europæus (*dec*; 6-20); E. japonicus (*ev*; 20) and vars.; Fagus sylvatica (*dec*; 60-100); Ficus Carica* (*dec*; 15-30) and vars.; Forsythia viridissima (*dec*; 10); F. suspensa (*dec*); Fraxinus americana (*dec*; 30-40); F. excelsior (*dec*; 30-80) and vars.; F. Ornus (*dec*; 20-30); F. oxyphylla parvifolia (*dec*; 30-50); Garrya elliptica (*ev*; 8-10); Gaultheria Shallon (*ev*; procumbent); Genista tinctoria (*ev*; 1-2); Ginkgo biloba (*dec*; 60-80); Gleditschia triacanthos (*dec*; 30-50); Hedera Helix vars. (*ev* climbers); Hibiscus syriacus (*dec*; 6) and vars.; Hippophae rhamnoides (*dec*; 2-20); Hypericum calycinum (*s-ev*; 1); Ilex Aquifolium (*ev*; 10-40) and vars.; Jasminum nudiflorum (*dec* climber); J. officinale (*dec* climber); Juglans nigra (*dec*; 60); J. regia (*dec*; 40-60) and vars.; Juniperus communis (*ev*; 3-20) and vars.; J. Sabina (*ev*; 5-8); Kerria japonica (*dec*; 3-4); Koelreuteria paniculata (*dec*; 10-15); Laburnum Adami (*dec*); L. alpinum (*dec*; 15-20); L. vulgare (*dec*; 20) and vars.; Laurus nobilis (*ev*; 30-60); Leycesteria formosa (*dec*; 4-6); Ligustrum japonicum* (*ev*; 6-8); L. lucidum* (*ev*; 8-12); L. vulgare (*s-ev*; 6-10) and vars.; Liriodendron tulipifera (*dec*; 75-100); Magnolia conspicua Soulangeana* (*dec*; 20-50); M. obovata discolor (*dec*; 5); Morus alba (*dec*; 20-30); M. nigra (*dec*; 20-30); M. rubra (*dec*; 40-70); Paulownia imperialis* (*dec*; 30); Philadelphus coronarius (*dec*; 2-10); Phillyrea media (*ev*; 10-15); Pinus sylvestris (*ev*; 50-100) and vars.; Platanus occidentalis (*dec*; 70-80); P. orientalis* (*dec*; 60-80) and vars.; Populus alba (*dec*; 60-100); P. monilifera* (*dec*; 80); P. nigra pyramidalis (*dec*; 50-60); P. Tremula (*dec*; 40-80); Potentilla fruticosa (*dec*; 2-4); Pyrus Aucuparia (*dec*; 10-30); P. prunifolia (*dec*; 20-30); P. spectabilis (*dec*; 20-30); Quercus Cerris vars. (*dec* or *s-ev*; 40-60); Q. coccinea (*dec*; 50); Q. Ilex* (*ev*; 15-60); Rhamnus Alaternus* (*ev*; 20); Rhododendron Anthopogon (*ev*; 1-1½); R. catawbiense (*ev*; 3-6); R. caucasicum (*ev*; 1); R. ciliatum (*ev*; 2); R. dahuricum* (*ev*; 3); R. ferrugineum (*ev*; 1); R. Fortunei (*ev*; 12); R. hirsutum (*ev*; 1-2); R. ponticum (*ev*; 6-12); Rhus Cotinus (*dec*; 6-8); R. typhina (*dec*; 10-30); Ribes alpinum aureum (*dec*; 3); R. aureum; R. sanguineum (*dec*; 4-8); Robinia Pseud-acacia (*dec*; 30-60) and vars.; Salix alba (*dec*; 80); S. babylonica (*dec*; 30); S. Caprea (*dec*; 15-30); S. viridis (*dec*; 30); Sambucus nigra (*dec*; 25); S. racemosa (*dec*; 10-20); Sophora japonica* (*dec*; 30-40); Spiræa Douglasii (*dec*; 3); S. japonica (*ev*; 4-6); S. Lindleyana (*dec*; 4-8); S. trilobata (*dec*; 1-2); Symphoricarpus racemosus (*dec*; 4-6); Syringa persica* (*dec*; 4-5); S. vulgaris* (*dec*; 8-20); Taxus adpressa (*ev*; 4); T. baccata (*ev*; 30-50); Thuya gigantea (*ev*; 50-150) and vars.; T. occidentalis (*ev*; 40-50); T. orientalis (*ev*; 18-20) and vars.; Thuyopsis dolabrata (*ev*; 40-50); Tilia argentea (*dec*; 30-50); T. petiolaris (*dec*; 50); T. platyphyllos (*dec*; 70-80); T. vulgaris (*dec*; 60-90); Ulmus campestris (*dec*; 125) and vars.; U. montana (*dec*; 80-120) and vars.; Viburnum Lantana (*dec*; 6-20); V. Opulus sterile* (*dec*; 6-8); V. Tinus* (*ev*; 8-10) and vars.; Vinca major (*dec*; procumbent) and vars.; Wistaria chinensis* (*dec* climber); Yucca acutifolia (*ev*); Y. angustifolia (*ev*; 4-5); Y. a. stricta (*ev*); Y. filamentosa vars. (*ev*); Y. gloriosa (*ev*; 4-6) and vars.

Towns—*continued.*

WATERSIDE.—For planting in close proximity to ornamental Waters, or on the banks of Rivers, the trees and shrubs named below will be found suitable. Some of them will also thrive in swamps, but the majority prefer an open soil in the immediate vicinity of running Water.

Acer macrophyllum (*dec*; 60); A. rubrum (*dec*; 20); Alnus glutinosa (*dec*; 50-60); Andromeda polifolia (*ev*; 1); Arbutus Unedo (*ev*; 8-10); Betula alba (*dec*; 50-60); B. lutea (*dec*; 70-80); B. nigra (*dec*; 60-70); B. papyracea (*dec*; 60-70); Caragana arborescens (*dec*; 15-20); C. frutescens (*dec*; 2-3); Catalpa bignonioides (*dec*; 20-40); Celtis crassifolia (*dec*; 20-30); Cerasus depressa (*dec*; 1); Chamæcyparis leptoclada (*ev*; 8-10); C. sphæroidea (*ev*; 40-70); Clematis virginiana (*dec* climber); Cornus circinata (*dec*; 5-10); C. paniculata (*dec*; 4-8); C. sericea (*dec*; 5-8); C. stolonifera (*dec*; 4-10); C. stricta (*dec*; 8-15); Cratægus apiifolia (*dec*; 10-20); C. coccinea (*dec*; 20-30); C. cordata (*dec*; 20); C. Crus-galli (*dec*; 10-30); C. Douglasii (*dec*; 10-15); C. Oxyacantha (*dec*; 10-20); C. Pyracantha (*ev*; 10-20); C. pyrifolia (*dec*; 6-10); C. tanacetifolia (*dec*; 12-20); Cryptomeria elegans (*ev*; 2-); C. japonica (*ev*; 50-100); Cydonia vulgaris (*dec*; 20); Dirca palustris (*dec*; 2-5); Halesia diptera (*dec*; 10); H. tetraptera (*dec*; 15-20); Juniperus phœnicea (*ev*; 15-18); J. recurva (*ev*; 5-8); J. virginiana (*ev*; 10-15) and vars.; Ledum palustre (*ev*; 2); Myrica cerifera (*ev*; 5-12); M. Gale (*dec*; 2-4); Oxycoccus macrocarpus (*ev* trailer); O. palustris (*ev* trailer); Picea ajanensis (*ev*; 70-80); P. alba (*ev*; 30-40); P. Engelmanni (*ev*; 80-100); P. Menziesii (*ev*; 50-70); P. nigra (*ev*; 50-80); P. orientalis (*ev*); P. Smithiana (*ev*; 80-120); Pinus austriaca (*ev*; 75-100) and var.; P. Balfouriana (*ev*; 40-50); P. Cembra (*ev*; 50-150); P. contorta (*ev*; 25-30); P. Coulteri (*ev*; 50-70); P. excelsa (*ev*; 60-150); P. ponderosa (*ev*; 100-150); P. rigida (*ev*; 30-45); P. Strobus (*ev*; 120-160); Platanus orientalis (*dec*; 60-80) and vars.; Populus alba (*dec*; 60-100) and vars.; P. balsamifera (*dec*; 70); P. monilifera (*dec*; 80); P. nigra (*dec*; 50-60) and vars.; P. Tremula (*dec*; 40-80) and vars.; Pterocarya fraxinifolia (*dec*; 20-40); Quercus coccinea (*dec*; 50); Q. macrocarpa (*dec*; 30); Q. rubra (*dec*); Rubus fruticosus cæsius (*dec*; prostrate); R. spectabilis (*dec*; 6-10); Salix alba (*dec*; 80); S. babylonica (*dec*; 30); S. Caprea (*dec*; 15-30); S. daphnoides (*dec*; 10-20); S. pentandra (*dec*; 6-8); S. phylicifolia (*dec*; 10); S. purpurea (*dec*; 5-10); S. rubra Helix (*dec*; 10-12); S. viridis (*dec*; 30); Shepherdia canadensis (*dec*; 3-6); Syringa Josikæa (*dec*; 5-10); Taxodium distichum (*dec*; 120) and vars.; Taxus canadensis (*ev*; 3-4); Thuya gigantea (*ev*; 50-150); T. occidentalis (*ev*; 40-50) and vars.; T. orientalis (*ev*; 18-20) and vars.; Thuyopsis dolabrata (*ev*; 40-50); Tsuga canadensis (*ev*; 60-80) and vars.; Ulmus montana (*dec*; 80-120) and vars.

Waterside—*continued.*

AN INDEX TO ANIMALS BENEFICIAL OR INJURIOUS TO HORTICULTURE.

FULL lists of the Insects and other Animals of special interest to horticulturists are subjoined, the useful species being given in one list and the injurious in another. In order to facilitate reference to any species, the heading is given in heavy type under which the information concerning it is chiefly to be found. In the case of certain species, however, that injure many kinds of plants without being specially restricted to any (*e.g.*, Cockchafers, Mole Crickets, Wireworms), it has not been found possible to give complete lists of references, and for these animals, therefore, only the most important headings have been mentioned.

Every effort has been made to render the information given in the DICTIONARY OF GARDENING upon this very important department of horticulture a reliable statement of all that is known with regard to the friends and foes of the gardener and farmer in the British Isles, and of the most effectual methods of detecting the presence and checking the ravages of harmful species. To do this more thoroughly foreign species have been described where there seems reason to believe that they may yet be found in Britain. But even should in the future some foes not described in this work prove hurtful, the means recommended under the headings in this list will be found beneficial against them also.

J. W. H. TRAIL.

USEFUL.

Apis mellifica. **Honey Bee; Wasps.**
Bombus lucorum, B. terrestris. **Humble Bee.**
Bufo vulgaris. **Toad.**
Carabus (Ground Beetles). **Insects.**
Chalcididæ. **Hymenoptera; Insects.**
Chrysopa vulgaris (Golden-eyed Fly). **Lacewing Fly.**
Cicindela (Tiger Beetle). **Insects.**
Coccinella bipunctata (Two-spotted Ladybird), C. septempunctata (Seven-spotted Ladybird), C. undecempunctata (Eleven-spotted Ladybird), C. variabilis (Variable Ladybird). **Ladybirds.**
Copris lunaris. **Unicorn Beetle.**
Drilus. **Snails.**
Epeira diadema ta (Garden Spider). **Spiders.**

Useful—*continued.*

Goerius olens (Devil's Coach Horse). **Staphylinidæ.**
Harpalus (Ground Beetle). **Insects.**
Hemerobius. **Lacewing Flies.**
Hypena proboscidalis. **Snout Moths.**
Ichneumonidæ. **Ichneumon Flies.**
Lampyris noctiluca (Glow-worm). **Insects** (COLEOPTERA).
Linyphia. **Spiders.**
Lumbricus (Earthworm). **Worms.**
Lycosa (Hunting Spider). **Spiders.**
Macroglossa stellatarum (Humming Bird Hawk Moth). **Microgaster.**
Mustela vulgaris. **Weasel.**
Myriapoda (Centipedes).
Neriene. **Spiders.**

Useful—*continued.*

Neuroptera (Stink Fly). **Insects; Lacewing Fly.**
Salticus (Leaping Spider). **Spiders.**
Staphylinidæ (Devil's Coach-horses, or Rove Beetles).
Syrphus (Hawk Fly).
Tachina. **Insects.**
Testacella haliotidea, T. Maugei. **Slugs; Testacella.**
Thrips Phylloxeræ. **Thrips.**
Vanessa Atalanta (Red Admiral Butterfly), V. Io (Peacock Butterfly), V. Urticæ (Small Tortoiseshell Butterfly). **Vanessa.**
Vespa Crabro (Hornet). **Wasps.**
Walckenaera. **Spiders.**

HURTFUL.

Abraxas grossulariata. **Gooseberry or Magpie Moth.**
Acarida. **Mites.**
Acherontia Atropos (Death's Head Hawk Moth). **Sphingidæ; Potato** (Insect Pests).
Acronycta psi (Dagger Moth). **Pear** (Insects).
Agrilus viridis. **Rosa** (Insects).
Agriotes lineatus, A. obscurus, A. sputator (Click Beetle, or Skipjack). **Wireworms.**
Agrotis exclamationis (Heart-and-Dart Moth), A. nigricans (Garden Dart Moth), A. segetum (Turnip Moth). **Noctua; Turnip Moth.**
Agrotis Tritici (White-line Dart Moth). **Noctua; Vine Moths.**
Aleyrodes Brassicæ. **Cabbage Powdered-wing.**
Aleyrodes proletella. **Snowy Fly.**
Aleyrodes vaporariorum (Snowy Fly). **Tomato** (Insects).
Altica. **Turnip Flea.**
Alucitina (Plume Moths). **Moths.**
Anarsia lineatella. **Peach** (Insect Pests).
Andricus curvator, A. glandium, A. inflator, A. terminalis (Oak-Apple Gall Fly). **Oak Galls.**
Anguillulidæ. **Nematoid Worms.**
Anomala Frischii, A. Vitis. **Vine** (Animal Pests).
Anthidium manicatum. **Wood-boring Bees.**
Anthomyia Betæ. **Beet or Mangold Fly.**
Anthomyia Brassicæ. **Cabbage Fly.**
Anthomyia canicularis, A. floccosa, A. floralis, A. radicum (Radish Fly), A. Raphani. **Radish** (Insects).
Anthomyia Lactucæ. **Lettuce Fly.**
Anthomyia (Phorbia) ceparum. **Onion Fly.**
Anthonomus druparum. **Peach** (Insect Pests).
Anthonomus pomorum. **Apple Blossom Weevil.**
Anthonomus prunicida (Plum Gouger). **Plum** (Insect Pests).
Anthonomus Rubi (Raspberry Weevil). **Raspberry** (Insects).
Antispila Pfeifferella. **Vine Moths.**
Aphides (Green Flies, or Plant Lice). **Aphides; Black Fly.**
Aphilothrix collaris, A. gemmæ (Artichoke Oak-Gall Fly), A. globuli. **Oak Galls.**
Aphis Amygdali, A. Persicæ. **Peach** (Insect Pests).
Aphis Cerasi, A. Rumicis (Collier). **Black Fly.**
Aphis lentiginis, A. pyraria. **Pear** (Insects).
Aphrophora spumaria (Frog or Cuckoo Spit). **Frog Hopper.**
Aporia Cratægi (Black-veined White Butterfly). **Hawthorn Caterpillars.**
Arctia Caja (Common Tiger Moth), A. villica (Cream-spotted Tiger Moth). **Tiger Moths.**
Arion ater (Black Slug), A. hortensis (Garden Slug). **Slugs.**
Armadillo vulgaris (Pill Millipede, or Woodlouse). **Oniscidæ.**
Aromia moschata. **Musk Beetle.**
Arvicola amphibia (Water Rat, or Water Vole). **Rats.**
Arvicola arvalis (Short-tailed Field Mouse or Vole). **Mice.**
Aspidiotus Camelliæ (Camellia Scale), A. Nerii, A. palmarum. **Scale Insects.**

Hurtful—*continued.*

Aspidiotus conchiformis (Oyster-shell Bark Louse). **Apple Mussel-scale; Scale Insects.**
Aspidiotus ostreæformis (Pear Oyster-scale). **Pear** (Insects); **Scale Insects.**
Athalia ancilla, A. spinarum (Nigger, or Black Palmer). **Turnip Sawfly.**
Athous hæmorrhoidalis. **Wireworms.**
Balaninus nucum. **Corylus** (Insects); **Nut Weevil.**
Baridius trinotatus (Potato-stalk Weevil). **Potato** (Insect Pests).
Batoneus Populi. **Populus** (Insect Pests).
Biorhiza aptera. **Oak Galls.**
Blatta orientalis. **Cockroach.**
Blennocampa pusilla. **Rose Sawflies.**
Bombycina. **Moths.**
Bombyx mori (Silkworm Moth). **Moths.**
Bombyx neustria. **Lackey Moth.**
Bostrichus bidentatus, B. chalcographus, B. cinereus, B. laricis, B. lineatus, B. micrographus, B. saturalis, B. typographus (Bark-beetles). **Scolytidæ.**
Brachelytra (Rove or Cocktail Beetles). **Staphylinidæ.**
Bruchidæ. **Pea** (Insect Pests).
Bruchus granarius. **Bean Beetle; Pea** (Insect Pests).
Bruchus Pisi. **Pea** (Insect Pests).
Byturus tomentosus (Raspberry Beetle), B. unicolor. **Raspberry** (Insects).
Callimorpha dominula (Scarlet Tiger Moth). **Tiger Moths.**
Carpocapsa funebrana (Plum Tortrix). **Plum** (Insect Pests).
Carpocapsa pomonana. **Apple or Codlin Grub.**
Cecidomyia floricola. **Tilia** (Insects).
Cecidomyia marginem-torquens, C. rosaria, C. salicina. **Salix** (Insects).
Cecidomyia œnophila. **Vine** (Animal Pests).
Cecidomyia Pisi. **Pea** (Insect Pests).
Cecidomyia Rosæ (Rose Gall Midge). **Rose Galls.**
Cecidomyia Tritici (Wheat Midge). **Red Maggot.**
Ceroplastes floridensis. **Scale Insects.**
Cetonia aurata (Rose Bug). **Rosechafer.**
Ceuthorhynchus assimilis. **Radish** (Insects); **Turnip-seed Weevil.**
Ceuthorhynchus contractus. **Turnip** (Animal Pests).
Ceuthorhynchus sulcicollis (Turnip-gall Weevil). **Cabbage-gall Weevil; Turnip Galls.**
Chærocampa Elpenor (Elephant Hawk Moth). **Sphingidæ.**
Cheimatobia brumata. **Winter Moth.**
Chermes. **Pinus** (Insects).
Chermes Abietis. **Spruce-gall Aphis.**
Chilognatha. **Myriapoda.**
Chionaspis Euonymi (Spindle-tree Scale). **Scale Insects.**
Chlorita viridula. **Potato** (Insect Pests).
Chrysomelidæ. **Populus** (Insect Pests).
Chrysopa vulgaris (Golden Eyes). **Lacewing Flies.**
Cidaria fulvata (Barred Yellow Moth). **Rosa** (Insects).
Cladius Padi, C. pectinicornis. **Rose Sawflies.**
Cnethocampa processionea (Processionary Moth). **Web-forming Caterpillars.**
Coccidæ (Mealy Bug and Scale). **Scale Insects.**
Coccotorus scutellaris (Plum Gouger). **Plum** (Insect Pests).
Coccus adonidum. **Mealy Bug.**
Coccus Vitis. **Vine Scale Insects.**
Coleophora hemerobiella. **Pear** (Insects).
Coleoptera. **Beetles; Insects.**
Conotrachelus nenuphar (Plum Curculio). **Plum** (Insect Pests).
Cossus ligniperda. **Goat Moth.**
Crioceris Asparagi (Cross-bearer). **Asparagus Beetle.**
Crioceris merdigera. **Lily Beetle.**
Crœsia Bergmanniana. **Rosa** (Insects).
Crœsia holmiana. **Pear** (Insects).
Crustacea. **Oniscidæ.**

Hurtful—*continued.*

Cryptocampus angustus, C. pentandræ. **Salix** (INSECTS).
Curculionidæ. **Weevils.**
Cynipidæ (True Gall Flies). **Oak Galls; Rose Galls.**
Cynips aptera, C. Kollari. **Oak Galls.**
Dactylopius adonidum, D. destructor, D. longifilis. **Scale Insects.**
Dasychira fascelina (Dark Tussock Moth), D. pudibunda (Pale Tussock Moth or Hop Dog). **Tussock Moths.**
Deilephila Elpenor, D. Porcellus (Elephant Hawk Moth). **Vine Moths.**
Deltoides. **Snout Moths.**
Depressaria. **Flat-body Moth; Parsnip** (INSECTS).
Depressaria cicutella (Common Flat-body Moth). **Depressaria.**
Depressaria daucella. **Carrot-blossom Moth.**
Depressaria depressella. **Purple Carrot-seed Moth.**
Depressaria heraclcana. **Parsnip-seed Moth.**
Dermaptera. **Earwigs.**
Diaspinæ. **Scale Insects.**
Diaspis ostreæformis (Pear Oyster-scale), D. Rosæ. **Scale Insects.**
Diastrophus Rubi. **Raspberry** (INSECTS).
Dicranura bicuspis (Alder Kitten), D. bifida (Poplar Kitten), D. furcula (Sallow Kitten), D. vinula (Puss Moth). **Puss Moth.**
Dictyopteryx contaminana. **Pear** (INSECTS).
Dineura stilata. **Hawthorn Caterpillars.**
Diplosis tremulæ. **Populus** (INSECT PESTS).
Diptera. **Insects.**
Ditula angustiorana. **Vine Moths.**
Diurni (Butterflies). **Insects; Lepidoptera.**
Dorcus parallelopipedus (Small Stag Beetle). **Lucanus cervus.**
Doryphora decemlineata (Colorado Beetle). **Potato Beetle.**
Dryophanta divisa, D. folii. **Oak Galls.**
Dryoteras terminalis (Oak-apple Gall Fly). **Oak Galls.**
Elateridæ (Snap Beetles, Spring Beetles, or Skipjacks). **Wireworms.**
Emphytus cinctus, E. melanarius, E. rufocinctus. **Rose Sawflies.**
Endopisa nigricana, E. proximana. **Pea** (INSECT PESTS).
Endrosis fenestrella. **Tineina.**
Eriocampa adumbrata, E. limacina (Pear or Plum Slug-worm). **Hawthorn Caterpillars; Slugworms.**
Eriocampa annulipes, E. ovata. **Slugworms.**
Eriocampa Rosæ. **Rose Sawflies; Slugworms.**
Eupœcilia ambiguella. **Vine Moths.**
Eupteryx picta, E. Solani (Frog Hopper). **Potato** (INSECT PESTS).
Euura. **Willow Sawflies.**
Fenusa Pumilio. **Raspberry** (INSECTS).
Fenusa Ulmi. **Sawflies.**
Fidonia piniaria (Bordered White Moth). **Pinus** (INSECTS).
Forficula auricularia. **Earwigs.**
Formicidæ. **Ants.**
Geometrina (Looper Moths). **Moths.**
Geotrupes stercorarius (Dor Beetle). **Shard-borne Beetle.**
Grapholitha botrana. **Vine Moths.**
Grapholitha pisana, G. tenebrosana. **Pea** (INSECT PESTS).
Gryllidæ. **Crickets.**
Gryllotalpa vulgaris. **Mole Cricket.**
Gryllus campestris (Field Cricket), G. domesticus (House Cricket). **Crickets.**
Hadena oleracea. **Potherb Moths.**
Halia Wavaria (V Moth). **Ribes** (INSECTS).
Haltica. **Turnip Flea.**
Harpalus ruficornis (Ground Beetle). **Insects** (COLEOPTERA).
Hedya ocellana. **Pear** (INSECTS).
Heliazeus Populi. **Populus** (INSECT PESTS).
Heliothrips adonidum, H. hæmorrhoidalis. **Thrips.**

Hurtful—*continued.*

Helix aspera (Common Snail), H. hortensis (Garden Snail), H. nemoralis, H. Pomatia. **Snails.**
Hemiptera Heteroptera, H. Homoptera. **Insects.**
Hepialus Humuli (Ghost Swift). **Otter Moth.**
Heterocera. **Insects; Lepidoptera.**
Heterodera radicicola. **Vine** (ANIMAL PESTS).
Heterodera Schachtii. **Nematoid Worms.**
Heteroptera (Plant Bugs). **Insects** (HEMIPTERA).
Homalomyia canicularis. **Radish** (INSECTS).
Homoptera. **Insects** (HEMIPTERA).
Hyalopterus Pruni. **Peach** (INSECT PESTS).
Hybernia aurantiaria (Scarce Umber Moth), H. defoliaria (Mottled Umber Moth). **Hybernia; Umber Moths.**
Hybernia leucophæaria (Spring Usher Moth), H. rupicapraria (Early Moth). **Hybernia.**
Hylesinus angustus, H. crenatus, H. Fraxini, H. palliatus, H. roligraphus, H. vittatus (Bark Beetles). **Scolytidæ.**
Hylesinus ater, H. opacus, H. piniperda. **Pine-bark Beetle; Scolytidæ.**
Hylobius Abietis. **Pine Weevils.**
Hylotoma enodis, H. gracilicornis, H. pagana, H. Rosæ **Rose Sawflies.**
Hymenoptera. Insects.
Hypena rostralis (Buttoned Snout Moth). **Pyralis.**
Hyponomeuta padella (Small Ermine Moth). **Hawthorn Caterpillars.**
Ixodes crinaceus (Dog Tick). **Ticks.**
Ixodidæ. **Ticks.**
Julus guttulatus, J. terrestris. **Millipedes.**
Lachnus. **Pinus** (INSECTS).
Lampronia rubiella. **Raspberry** (INSECTS).
Lasioptera obfuscata (Wheat Midge). **Red Maggot.**
Lasioptera Rubi (Raspberry Midge). **Raspberry** (INSECTS).
Lasioptera Vitis (Vine Midge). **Vine Galls.**
Lecanium hesperidum. **Scale Insects.**
Lecanium Persicæ (Peach Scale). **Peach** (INSECT PESTS).
Lecanium Vitis (Vine Scale). **Vine Scale Insects.**
Lema trilineata (Three-lined Leaf Beetle). **Potato** (INSECT PESTS).
Lepidoptera. Insects; Moths.
Leptus autumnalis (Harvest Bug). **Mites.**
Limax agrestis (Field Slug), L. arborum (Tree Slug), L. maximus (Great Slug), L. Sowerbii (Keeled Slug). **Slugs.**
Limax flavus. **Slugs; Yellow Slug.**
Lina Populi, L. Tremulæ. **Populus** (INSECT PESTS).
Liparis auriflua (Gold-tail Moth), L. chrysorrhæa (Brown-tail Moth), L. monacha (Black Arches), L. Salicis (Satin Moth). **Liparis.**
Liparis dispar. **Gipsy Moth; Liparis.**
Lithocolletis. **Leaf-miners.**
Lobesia reliquana. **Vine Moths.**
Longicornia. **Musk Beetle.**
Lophyrus frutetorum, L. Pini, L. rufa, L. sertiferus, L. virens. **Pine Sawflies.**
Lozotænia rosana. **Pear** (INSECTS); **Rosa** (INSECTS).
Lucanus cervus. **Stag Beetle.**
Lyda campestris, L. Pyri. **Lyda.**
Lyda erythrocephala, L. nemorum, L. stellata. **Pine Sawflies.**
Lyda inanita. **Rose Sawflies.**
Lyda nemoralis. **Lyda; Peach** (INSECT PESTS).
Lyda punctata. **Hawthorn Caterpillars.**
Macrocnema exoleta. **Potato** (INSECT PESTS).
Mamestra Brassicæ. **Cabbage Moth; Mamestra.**
Melolontha vulgaris. **Cockchafers; May Bugs.**
Merodon clavipes, M. equestris. **Narcissus Fly.**
Microlepidoptera. **Moths.**
Mus decumanus (Brown or Norway Rat), M. Rattus (Black Rat). **Rats.**
Mus sylvaticus (Long-tailed Field Mouse). **Mice.**

Hurtful—*continued.*

Myriapoda. Millipedes.
Mytilaspis pomorum. **Scale Insects.**
Mytilaspis Vitis. **Vine Scale Insects.**
Myzus Persicæ. **Peach** (Insect Pests).
Myzus Ribis. **Ribes** (Insects).
Nænia typica (Gothic Moth). **Vine Moths.**
Nematus abbreviatus, N. bellus, N. gallarum, N. ischnocerus. N. herbaceæ, N. Salicis-cinereæ, N. vacciniellus, N. vesicator. **Nematus.**
Nematus appendiculatus, N. consobrinus. **Nematus; Ribes** (Insects).
Nematus gallicola, N. pedunculi. **Willow Sawflies.**
Nematus Ribesii. **Gooseberry and Currant Sawfly; Ribes** (Insects).
Nematus viminalis. **Salix** (Insects).
Nemeophila plantaginis (Wood Tiger Moth). **Tiger Moths.**
Nepticula. **Rosa** (Insects).
Neuroptera. **Insects.**
Neuroterus fumipennis, N. læviusculus, N. lenticularis (Oak Spangle Gall Flies), N. numismatis (Silky Button Oak Gall Fly). **Oak Galls.**
Noctua (Night Moths).
Noctuidæ. **Moths; Noctua.**
Notodontidæ. **Moths.**
Œnectra Pilleriana. **Vine Moths.**
Oniscidæ (Woodlice, or Slaters).
Oniscus asellus. **Oniscidæ.**
Orchestes Fagi, O. Quercus (Oak Weevil). **Orchestes.**
Orgyia antiqua (Vapourer Moth).
Orthoptera. **Insects.**
Otiorhynchus Ligustici. **Otiorhynchus; Peach** (Insect Pests).
Otiorhynchus picipes (Clay-coloured Vine Weevil, or Pitchy-legged Weevil), O. raucus, O. sulcatus (Black Vine Weevil), O. tenebricosus (Red-legged Garden Weevil). **Otiorhynchus.**
Oxyuris vermicularis. **Nematoid Worms.**
Pardia tripunctana. **Rosa** (Insects).
Pemphigus bursarius. **Pemphigus; Populus** (Insect Pests).
Pemphigus fuscifrons, P. lactucarius. **Lettuce** (Insects).
Pemphigus spirothecæ. **Populus** (Insect Pests).
Peronea aspersana, P. comparana (Strawberry-leaf Button Moths). **Strawberry** (Insects).
Peronea variegana. **Rosa** (Insects).
Phaedon Betulæ (Mustard Beetle).
Phalæna Wavaria (V Moth). **Ribes** (Insects).
Phorodon Humuli (Hop Aphis), P. Mahaleb. **Plum** (Insect Pests).
Phragmatobia fuliginosa (Ruby Tiger Moth). **Tiger Moths.**
Phratora vitellinæ (Willow-leaf Beetle).
Phyllobius oblongus, P. Pyri, P. viridicollis. **Phyllobius.**
Phyllopertha horticola (Bracken Clock, or Lesser May Bug). **May Bugs; Rosa** (Insects).
Phyllotreta concinna, P. consobrina? (Hop Flea), P. flexuosa, P. Lepidii, P. nemorum (Turnip Flea, or Turnip Fly), P. obscurella. **Turnip Flea.**
Phylloxera vastatrix. **Grape or Vine Louse.**
Physopoda. **Thrips.**
Phytomyza. Pea (Insect Pests).
Phytomyza Ilicis. **Holly-leaf Fly.**
Phytomyza nigricornis. **Phytomyza.**
Phytoptidæ (Gall Mites). **Mites; Pinus** (Insects); **Plum** (Insect Pests); **Populus** (Insect Pests).
Phytoptus Pyri. **Pear** (Insects).
Phytoptus Ribis. **Ribes** (Insects).
Phytoptus Vitis. **Vine** (Animal Pests).
Pieris Brassicæ (Large White Cabbage Butterfly), P. Rapæ (Small White Cabbage Butterfly). **Cabbage Caterpillars.**
Pionea forficalis (Garden Pebble Moth).

Hurtful—*continued.*

Piophila Apii (Celery-stem Fly).
Pissodes notatus, P. Pini. **Pine Weevils.**
Platypus cylindrus. **Oak** (Insect Pests).
Plusia Gamma (Silver-Y or Gamma Moth).
Plutella cruciferarum (Diamond-back or Turnip Moth).
Poecilosma candidatum. **Rosa** (Insects); **Rose Sawflies.**
Polydesmus complanatus. **Millipedes.**
Porcellio scaber (Woodlouse). **Oniscidæ.**
Pseudo-bombyces. **Moths.**
Psila Rosæ (Carrot Fly). **Carrot Grub; Parsnip** (Insects).
Psylla apiophila, P. Pyri (Pear Sucker), P. pyricola, P. simulans. **Pear.** (Insects).
Psylla Mali. **Psylla.**
Psylla pyrisuga. **Pear** (Insects); **Psylla.**
Pterophorina (Plume Moth). **Moths.**
Pygæra bucephala. **Buff-tip Moth.**
Pyralidina. **Moths.**
Pyralis rostralis (Hop Snout Moth).
Retinia Buoliana, R. duplana, R. occultana, R. pinicolana, R. resinana, R. turionana. **Retinia.**
Rhodites centifoliæ, R. Eglanteriæ, R. Mayri, R. Rosæ, R. rosarum (Rose Gall Insects), R. Spinosissimæ. **Rhodites; Rose Galls.**
Rhopalocera. **Moths.**
Rhopalosiphum Ribis. **Ribes** (Insects).
Rhynchites Alliariæ, R. Bacchus, R. Betuleti, R. bicolor, R. conicus. **Rhynchites.**
Rhynchites cupreus. **Plum** (Insect Pests); **Rhynchites.**
Rhynchophora. **Weevils.**
Rusina. **Noctua.**
Saperda carcharias, S. populnea. **Populus** (Insect Pests); **Saperda.**
Sarcoptes scabiei (Itch Mite). **Mites.**
Saturnia. **Moths.**
Schizoneura lanigera. **American Blight; Woolly Aphis.**
Scolytidæ (Bark Beetles).
Scolytus destructor, S. Geoffroyi, S. Pruni, S. pygmæus, S. Ratzeburgi. **Scolytidæ.**
Selandria Cerasi. **Slugworms.**
Selandria Rosæ. **Rose Sawflies.**
Selandria Vitis. **Vine Slug.**
Sesia apiformis (Hornet Clearwing Moth). **Populus** (Insect Pests).
Sesia bembeciformis (Willow Hornet Clearwing Moth), S. formicæformis (Red-tipped Clearwing Moth), S. vespiformis. **Sesia.**
Sesia myopæformis (Red-belted Clearwing Moth). **Pear** (Insects).
Sesia tipuliformis. **Currant Clearwing Moth.**
Silpha opaca. **Beet Carrion Beetle; Silpha.**
Siphonophora dirhoda, S. Rosæ, S. rosarum. **Rosa** (Insects).
Siphonophora Pisi. **Pea** (Insect Pests).
Sirex gigas (Giant Sirex), S. juvencus (Steel-blue Sirex). **Sirex.**
Sitona crinita (Spotted Pea Weevil), S. lineata (Striped Pea Weevil). **Pea** (Insect Pests); **Sitona.**
Smerinthus ocellatus (Eyed Hawk Moth), S. Populi (Poplar Hawk Moth), S. Tiliæ (Lime Hawk Moth). **Sphingidæ.**
Spathegaster baccarum (Currant Gall Fly), S. Taschenbergi, S. vesicatrix (Oak Blister Gall Fly). **Oak Galls.**
Sphingidæ. Moths.
Sphinx Atropos. **Death's Head Moth; Potato** (Insect Pests).
Sphinx Ligustri (Privet Hawk Moth). **Sphingidæ.**
Spilonota roborata. **Rosa** (Insects).
Talpa europæa. **Mole.**
Termes lucifugus, T. ruficollis. **White Ants.**

Hurtful—*continued.*

Tenthredinidæ. Sawflies.
Tenthredo Cerasi. **Slugworms.**
Tephritis Onopordinis (Celery-leaf Miner). **Celery Fly; Parsnip** (PESTS).
Tetranychidæ (Plant Mites). **Mites.**
Tetranychus (Harvest Bug). **Mites; Tetranychus telarius.**
Tetranychus telarius. Red Spider.
Thera coniferata, T. firmata (Pine Carpet Moth), T. juniperata, T. variata (Juniper Moth). **Juniper Moths.**
Thysanoptera. **Thrips.**
Tinea. **Tineina.**
Tineina. Moths.
Tipula maculosa, T. oleracea (Daddy Long Legs; larva called the Grub or Leather Jacket). **Crane Fly; Tipulidæ.**
Tipulidæ (Crane Flies).
Tischeria. **Rosa** (INSECTS).
Tomicus bidentatus, T. Laricis. **Pine Bark Beetles.**
Tortricina. Moths.
Tortrix angustiorana, T. heparana, T. icterana. **Tortrix.**

Hurtful—*continued.*

Tortrix Pilleriana, T. vitisana. **Tortrix; Vine Moths.**
Tortrix ribeana. **Pear** (INSECTS); **Tortrix.**
Tortrix viridana. **Oak** (INSECT PESTS); **Tortrix.**
Trachea piniperda (Pine Beauty Moth). **Pinus** (INSECTS); **Trachea.**
Tremex columba (Pigeon Tremex). **Tremex.**
Trichiosoma lucorum. **Sawflies.**
Tryphæna fimbria (Broad-bordered Yellow Underwing Moth), T. ianthina (Lesser Broad-bordered Yellow Underwing Moth), T. interjecta (Least Yellow Underwing Moth), T. Orbona (Lesser Yellow Underwing Moth), T. Pronuba (Common Yellow Underwing Moth), T. subsequa. **Tryphæna.**
Tychius quinquepunctatus. **Pea** (INSECT PESTS).
Tylenchus devastatrix, T. Dipsaci, T. Tritici. **Nematoid Worms.**
Typhlocyba Rosæ. **Rosa** (INSECTS).
Vanessa Antiopa (Camberwell Beauty Butterfly), V. polychloros (Great Tortoiseshell Butterfly). **Vanessa.**
Vespa vulgaris. **Wasps.**
Xyleborus dryographus. **Oak** (INSECT PESTS).
Zeuzera Æsculi. Leopard Moth.

SYNONYMS AND CROSS-REFERENCES.

DURING the progress of the Dictionary of Gardening, I have received many letters complaining that certain plants had not been mentioned in its pages. In the vast majority of cases, the plants quoted as omissions have appeared under their correct names; but the anticipated or absolutely incorrect names have, through various causes, been omitted. Frequently, too, it has happened that a plant well-known under some incorrect name should have been placed in a genus the initial letters of which had already been passed; in most of such cases, the information as to correct name is given in the body of the work—a case in point is *Acanthophlox Lowi*, which is really *Dendrio marmorata*. The cross-references in this list will enable correct names to be readily ascertained.

The genus *Areca* furnishes an example of another kind. The plants described in the Dictionary under this name are true Areca, but in gardens and nurseries a number of widely different plants are included under the same generic name. Some difficulty might, therefore, arise in the case of those who are not aware of the great changes in nomenclature which have occurred amongst Palms, and some time would be lost in referring to the half-dozen genera mentioned as containing species formerly placed under *Areca*. The list of Synonyms and Cross-references will render it easy for anyone to arrive at the information they seek, *e.g.*, *Areca Bauri* is referred to its proper genus — *Kentiopsis*; *A. lutescens* to *Chrysalidocarpus*; *A. Verschaffelti* to *Hyophorbe*, &c.

Not unfrequently the correct name of a plant has been discovered when too late to insert it after the garden name. *Aralia Chabrierii* is a case in point; this has not yet flowered in this country, and its real affinities might have remained obscure for an indefinite period, had not my colleague, Mr. Watson, noticing the resemblance between *Aralia Chabrierii* of the nurseries and a plant in a foreign botanic garden under the name of *Eleutherococcus*, carefully compared, on his return, the material he collected for the purpose, and proved the *Aralia Chabrierii* in question to be no Aralia at all, but *Eleodendron orientale*, a native of Mauritius, &c. (no origin was published in the nursery catalogues). This list contains many such corrections.

In order to economise space, when the specific name remains unchanged under another genus the cross-reference to the genus alone will be given. Synonyms and names of included genera to which reference is made are printed in italics.

GEORGE NICHOLSON.

Synonyms and Cross-references—*continued.*

Abama = **Narthecium.**
Abena = **Stachytarpheta.**
Abies includes *Keteleeria.*
A. Alcoquiana = **Picea ajanensis.**
A. Kæmpferi = **Pseudolarix Kæmpferi.**
A. polita. Correct name is **Picea polita.**
Abronia = *Tricratus.*
Absinthium is included under **Artemisia.**
Abumon = **Agapanthus.**
Acacia includes *Farnesia.* The hardy deciduous tree so-called in gardens is **Robinia pseudacacia.**
A. Julibrissin = **Albizzia Julibrissin.**
A. Lebbek. Correct name is **Albizzia Lebbek.**
A. lophantha = **Albizzia lophantha.**
A. Nemu = **Albizzia Julibrissin.**
Acæna = *Ancistrum.*
Acajuba = **Anacardium.**
Acalypha = *Cupameni.*
Acanthephippium = *Acanthophippium.*
Acanthoglossum = **Cœlogyne.**
Acantholimon = *Armeriastrum.*
Acanthopanax ricinifolium is the correct name of *Aralia Maximowiczii.*
Acanthophippium = **Acanthephippium.**
Acanthorhiza aculeata = *Trithrinax aculeata.*
Acanthus includes *Dilivaria.*
Acer cissifolium = **Negundo cissifolium.**
Aceranthus diphyllus = **Epimedium diphyllum.**
Achillea includes *Ptarmica.*
Achimenes (= *Cyrilla* and *Trevirana*) includes *Dolichoderia, Eucodonia, Koërnickia, Locheria,* and *Scheeria.*
A. cupreata. Correct name is **Episcia cupreata.**
A. ocellata = **Isoloma ocellatum.**
A. picta = **Isoloma bogotense.**
Achimenes (of Vahl) = **Artanema.**
Achras (in part) = **Sideroxylon.**
A. Sapota is the correct name of *Sapota Achras.*
Achroanthes = **Microstylis.**
Achyranthes Verschaffeltii = **Iresine Herbstii.**
Achyronia is included under **Priestleya.**
Achyropappus is included under **Schkuhria.**
Acineta = *Neippergia.*
Acinos vulgaris = **Calamintha Acinos.**
Aciotis = *Spennera.*
Aciphylla = *Gingidium* (of Mueller).
Acis is now included under **Leucoium.**
A. grandiflorus. Correct name is **Leucoium trichophyllum grandiflorum.**
A. roseus. Correct name is **Leucoium roseum.**
A. trichophyllus. Correct name is **Leucoium trichophyllum.**
Acisanthera = *Uranthera.*
Acmella is included under **Spilanthes.**
Acokanthera venenata = **Toxicophlæa Thunbergii.**
Acridocarpus = *Anomalopteris.*
Acroclinium is included, by Bentham and Hooker, under **Helipterum.**
Acronychia = *Cyminosma* and *Jambolifera.*
Acrophorus hispidus = **Davallia Novæ-Zealandiæ.**
Acrophyllum = *Calycomis* (of Don).
Acrossanthes = **Vismia.**
Acrostichum includes *Hymenolepis, Jenkinsia, Leptochilus, Macroplethus, Microstaphyla, Photinopteris, Pœcilopteris, Teratophyllum.*
A. tenuifolium = *Lomaria tenuifolia.*
Actæa.
A. cimicifuga = **Cimicifuga elata.**
A. cordifolia = **Cimicifuga cordifolia.**
A. dioica = **Xanthorrhiza apiifolia.**
A. gyrostachya = **Cimicifuga racemosa.**
A. monogyna = **Cimicifuga racemosa.**
A. orthostachya = **Cimicifuga racemosa.**
A. palmata = **Trautvetteria palmata.**
A. podocarpa = **Cimicifuga americana.**
A. racemosa = **Cimicifuga racemosa.**
Actinocarpus Damasonium. Correct name is **Damasonium stellatum.**
Actinolepis (= *Hymenoxys*) is the correct name of *Ptilomeris.*
Actinomeris = *Pterophyton.*
Actinophyllum = **Sciadophyllum.**
Actinostachys is included under **Schizæa.**
Actinotus = *Eriocalia.*
Acunna = **Befaria.**
Acyntha = **Sanseviera.**
Adamia.
A. cyanea. Correct name is **Dichroa febrifuga.**
A. sylvatica. Correct name is **Dichroa sylvatica.**
Adansonia = *Ophelus.*
Adenandra = *Glandulifolia.*
Adenilema = **Neillia.**
Adenophora = *Floërkea.*
Adenopodia = **Entada.**
Adenostyles = **Zeuxina.**
Adenotrichia is included under **Senecio.**
A. amplexicaulis = **Senecio Adenotrichia.**
Adhatoda = *Duvernoia.*
Adhatoda (in part) = **Justicia.**
Adiantum includes *Hewardia.*
A. Farleyense is a variety of *A. tenerum.*
Adike = **Pilea.**
Adina globifera is the correct name of *Nauclea Adina.*
Æchmea includes, according to Bentham and Hooker, *Canistrum, Echinostachys, Hohenbergia, Hoplophytum, Lamprococcus,* and *Pironneaua.*
Æ. Legrelliana = **Portea Legrelliana.**
Æ. Ortgiesii. Correct name is **Portea tillandsioides.**
Æcidium = **Peridermium.**
Ægiceras = *Malaspinæa.*
Ægilops = **Triticum.**
Æginetia (of Cavanilles) = **Bouvardia.**
Ægiphila = *Manabea, Omphalococca.*
Ægle sepiaria is the correct name of *Citrus trifoliata.*
Æonium is included under **Sempervivum.**
Aërides.
A. dasypogon = **Sarcanthus erinaceus.**
A. Huttoni = **Saccolabium Huttoni.**
A. maculosum. Correct name is **Saccolabium speciosum.**
A. paniculatum = **Sarcanthus paniculatus.**
A. rubrum = **Sarcanthus erinaceus.**
A. testaceum = **Vanda parviflora.**
A. Wightianum = **Vanda parviflora.**
Ærobion eburneum = **Angræcum eburneum.**
Æschynomene aristata = **Pictetia aristata.**
Æsculus = *Hippocastanum.*
Æ. macrostachya = **Pavia alba.**
Æ. parviflora = **Pavia alba.**
Æ. Pavia = **Pavia rubra.**
Æthionema coridifolium = *Iberis jucunda.*
Agallostachys = **Bromelia.**
Agalmyla = *Orithalia.*
Aganisia = *Koellensteinia.*
Aganosma = *Ichnocarpus.*
Agapanthus = *Abumon.*
Agathis is the correct name of **Dammara.**
Agathomeris = **Humea.**
Agathotes = **Swertia.**
Agati is now included, by Bentham and Hooker, under **Sesbania.**
Agave includes *Littæa.*
Ageratum (= *Carelia*) includes *Cœlestina* (of Adanson).
A. latifolium = **Piqueria latifolia.**
Aglæa = **Melasphærula.**
Agoseris = **Troximon.**
Agraphis.
A. nutans = **Scilla nutans.**
A. paniculata = **Scilla hispanica.**
Agriophyllum = **Berkheya.**
Agrostemma is now included, by Bentham and Hooker, under **Lychnis.**
Agrosticula = **Sporobolus.**
Agrostis = *Vilfa* (of Adanson).
Agrostis (in part) is included under **Sporobolus.**
A. spica-venti. Correct name is **Apera spica-venti.**
Agylophora = **Uncaria.**
Ailantus flavescens = **Cedrela sinensis.**
Aiphanes = **Martinezia.**
Aira = *Fusaria.*
A. flexuosa. Correct name is **Deschampsia flexuosa.**
Ajax is included under **Narcissus.**
A. bicolor = **Narcissus Pseudo-Narcissus bicolor.**
Ajuga includes *Chamæpithys.*
Alarconia = **Wyethia.**
Albikia = **Hypolytrum.**
Albina = **Alpinia.**
Albuca.
A. exuviata = **Urginea exuviata.**
A. filifolia = **Urginea filifolia.**
A. fugax = **Urginea fragrans.**
A. Gardeni = **Speirantha convallarioides.**
A. physodes = **Urginea physodes.**

Synonyms and Cross-references—*continued.*

Aldea = **Phacelia.**
Alectorolophus = **Rhinanthus.**
Alegria = **Luhea.**
Aletris = **Stachyopogon.**
Alfonsia = **Elæis.**
Alga = **Zostera.**
Algarobia is included under **Prosopis.**
Alibertia = *Cordiera.*
Alipsa = **Liparis.**
Alisma natans. Correct name is **Elisma natans.**
Allagoptera = **Diplothemium.**
Allamanda = *Orelia.*
Allantodia australe = **Asplenium umbrosum.**
Allium includes, according to Bentham and Hooker, *Nectaroscordum, Ophioscorodon, Porrum,* and *Schœnoprasum.*
A. fragrans = **Nothoscordum fragrans.**
Allobrogia = **Paradisia.**
Allochlamys = **Pleuropetalum.**
Allophyllus = **Schmidelia.**
Alloplectus (= *Crantzia* and *Lophia*) includes *Heintzia* and *Macrochlamys.*
Almeidea = *Aruba.*
Alocasia.
A. albo-violacea = **Xanthosoma maculatum.**
A. argyroneura = **Caladium Schomburgkii.**
A. erythræa = **Caladium Schomburgkii Schmitzii.**
A. Johnstoni. Correct name is **Cyrtosperma Johnstoni.**
Aloe includes, according to Bentham and Hooker, *Bowiea* (of Haworth), *Pachidendron,* and *Rhipodendron.*
Alonsoa includes *Hemimeris* (of Humboldt, Bonpland, and Kunth).
Alophia (= *Herbertia*) is the correct name of **Trifurcia.**
Aloysia is now included, by Bentham and Hooker, under **Lippia.**
Alpinia (= *Albina, Buekia, Catimbium, Galanga, Heritiera* of Retz, *Languas,* and *Martensia*) includes *Hellenia.*
Alsine is now included, by Bentham and Hooker, under **Arenaria.**
Alsophila includes *Lophosorus, Trichopteris,* and *Trichosorus.*
Altingiaceæ is included under **Hamamelideæ.**
Altora = **Cluytia.**
Alyssum includes *Berteroa, Meniocus, Odontarrhena, Psilonema,* and *Schivereckia.*
A. maritimum = *Kœniga maritima.*
A. spinosum = *Kœniga spinosa.*
A. utriculatum = **Vesicaria græca.**
Amalias = **Lælia.**
Amaryllis.
A. Atamasco = **Zephyranthes Atamasco.**
A. aulica = **Hippeastrum aulicum.**
A. candida = **Zephyranthes candida.**
A. formosissima = **Sprekelia formosissima.**
A. lutea = **Sternbergia lutea.**
A. pratensis = **Hippeastrum pratense.**
A. purpurea = **Vallota purpurea major.**

Amaryllis—*continued.*
A. stellaris = **Hessea stellaris.**
A. tubispatha = **Zephyranthes tubispatha.**
Amasonia punicea (of gardens) = *Taligalea punicea.* Correct name is **A. calycina.**
Amblyanthera = **Mandevilla.**
Amblyglottis = **Calanthe.**
Amelanchier = *Aronia* (in part).
Amianthium is included under **Zygadenus.**
Amischotolype = **Forrestia.**
Ammogeton is included under **Troximon.**
A. scorzoneræfolium = **Troximon glaucum dasycephalum.**
Ammolirion = **Eremurus.**
Amorphophallus (= *Pythion*) should include *Brachyspatha, Conophallus, Corynophallus, Proteinophallus,* and *Tapeinophallus.*
A. Lacouri. Correct name is **Pseudodracontium Lacourii.**
Ampelosicyos = **Telfairia.**
Amphiblestra is included under **Pteris.**
Amphicarpæa = *Cryptolobus.*
Amphidonax = **Arundo.**
Amphilobium = **Amphilophium.**
Amphion = **Semele.**
Amygdaleæ is included under **Rosaceæ.**
Amygdalopsis is included under **Prunus.**
A. Lindleyi = **Prunus triloba.**
Anacardium = *Acajuba* and *Cassuvium.*
Anacharis = **Elodea.**
Anadenia Manglesii = **Grevillea glabrata.**
Ananas is the correct name of *Ananassa.*
Ananassa. Correct name is **Ananas.**
Ananthopus = **Commelina.**
Anapeltis.
A. geminata = **Polypodium geminatum.**
A. lycopodioides = **Polypodium lycopodioides.**
A. venosa = **Polypodium stigmaticum.**
Anchistea is included under **Woodwardia.**
Anchusa = *Buglossum.*
Anchusopsis = **Lindelofia.**
Ancistrum = **Acæna.**
Ancylocladus = **Willughbeia.**
Andreusia = **Myoporum.**
Andromachia = **Liabum.**
Andromeda.
A. acuminata = **Leucothoë acuminata.**
A. arborea = **Oxydendron arboreum.**
A. calyculata = **Cassandra calyculata.**
A. campanulata = **Enkianthus campanulatus.**
A. cassinæfolia = **Zenobia speciosa.**
A. Catesbæi = **Leucothoë Catesbæi.**
A. dealbata = **Zenobia speciosa pulverulenta.**
A. fastigiata = **Cassiope fastigiata.**
A. floribunda = **Pieris floribunda.**
A. hypnoides = **Cassiope hypnoides.**
A. japonica = **Pieris japonica.**
A. paniculata = **Lyonia ligustrina.**
A. pulverulenta = **Zenobia speciosa pulverulenta.**

Andromeda—*continued.*
A. recurva = **Leucothoë recurva.**
A. rigida = **Lyonia ferruginea.**
A. speciosa = **Zenobia speciosa.**
A. tetragona = **Cassiope tetragona.**
Androsace Vitaliana. [Correct name is **Douglasia Vitaliana.**
Andryala = *Forneum.*
Anecochilus = **Anœctochilus.**
Aneilema = *Anilema* and *Aphylax.*
Anemia (of Nuttall) = **Houttuynia.**
Anemiopsis = **Houttuynia.**
Anemone includes *Hepatica* and *Pulsatilla.*
Anemopægma racemosum is the correct name of *Bignonia Chamberlaynii.*
Angelonia = *Schelveria.*
A. cornigera is the correct name of *Physidium cornigerum.*
A. Gardneri is the correct name of *Physidium Gardneri.*
Angiopteris includes *Psilodochea.*
Angræcum = *Ærobion.*
Ania = **Tainia.**
Anigosia = **Anigozanthos.**
Anigozanthos = *Anigosia* and *Schwœgrichenia.*
Anilema = **Aneilema.**
Anisanthus splendens = **Antholyza caffra.**
Anisodus is included under **Scopolia.**
Anisolobus = **Odontadenia.**
Anisomeris = **Chomelia.**
Anneslea = **Calliandra.**
Anœctochilus = *Anecochilus* and *Chrysobaphus.*
A. argenteus = **Physurus argenteus.**
A. a. pictus = **Physurus pictus.**
A. lineatus = **Zeuxina regia.**
A. Lowii. Correct name is **Dossinia marmorata.**
A. nobilis = **Physurus nobilis.**
A. pictus = **Physurus pictus.**
Anoma = **Moringa.**
Anomalopteris = **Acridocarpus.**
Anomorhegmia = **Stauranthera.**
Anona chrysopetala = **Guatteria Ouregou.**
Anonymo = **Saururus.**
Anoplanthus (in part) = **Phelipæa.**
Anoplophytum amœnum = **Tillandsia pulchra amœna.**
A. incanum = **Tillandsia Gardneri.**
Antennaria margaritacea = **Gnaphalium margaritaceum.**
Anthemis includes *Chamomilla* (in part).
Anthericlis = **Tipularia.**
Anthericum (= *Phalangium*) includes *Liliago.*
A. alooides = **Bulbine alooides.**
A. annuum = **Bulbine annua.**
A. Liliastrum. Correct name is **Paradisia Liliastrum.**
A. plumosum = **Bottionea thysanotoides.**
A. pomeridianum = **Chlorogalum pomeridianum.**
Anthodon is included under **Salacia.**
Antholyza = *Cunonia* (of Miller) and *Petamenes.*
A. brevifolia = **Antholyza caffra.**
A. fulgens = **Watsonia angusta.**
A. Meriana = **Watsonia Meriana.**
A. Merianella = **Watsonia alctroides.**
A. rupestris = **Antholyza caffra.**
A. spicata = **Watsonia brevifolia.**

Synonyms and Cross-references—*continued.*

Anthurium.
A. candidum=**Spathiphyllum candidum.**
A. Dechardi=**Spathiphyllum cannæfolium.**
A. Hookeri=**Pothos acaulis.**
A. Patini=**Spathiphyllum Patini.**
Anthyllis cretica=**Ebenus cretica.**
Anticlea is included under **Zygadenus**
Antidesmeæ is included under **Euphorbiaceæ.**
Antirrhineæ is included under **Scrophularineæ.**
Antirrhinum includes *Asarina.*
Antonia (of Brown)=**Rhynchoglossum.**
Antrophyum includes *Polytænium* and *Scoliosorus.*
Apalanthe=**Elodea.**
Apaturia is included under **Pachystoma.**
Apenula=**Specularia.**
Aphelandra (= *Hemisandra* and *Synandra*) includes, according to Bentham and Hooker, *Hydromestes* and *Strobilorachis.*
A. longiscapa (of gardens)=**Thyrsacanthus strictus.**
Aphylax=**Aneilema.**
Apiaceæ is included under **Umbelliferæ.**
Apiospermum=**Pistia.**
Aplopappus=**Haplopappus.**
Aplophyllum is included under **Ruta.**
Aplotaxis is included under **Saussurea.**
Aponogeton (=*Spathium*, of Edgworth) should include *Ouvirandra.*
Aporetica=**Schmidelia.**
Aquartia is included under **Solanum.**
Aquilarineæ is included under **Thymelæaceæ.**
Arabis includes *Stevenia* and *Turritis.*
Arachnanthe Lowei is the correct name of *Renanthera Lowei.*
Arachnimorpha=**Rondeletia.**
Arachnites (in part)=**Ophrys** (in part).
Aralia should include *Dimorphanthus.*
A. Chabrierii. Correct name is **Elæodendron orientale.**
A. crassifolia Pseudopanax crassifolia.
A. Ghiesbreghtii=**Monopanax Ghiesbreghtii.**
A. papyrifera=**Fatsia papyrifera.**
A. platanifolia=**Oreopanax platanifolia.**
A. quinquefolia=**Panax quinquefolium.**
A. Sieboldii=**Fatsia japonica.**
A. splendidissima=**Panax Murrayi.**
A. Thibautii=**Oreopanax Thibautii.**
A. trifolia=**Pseudopanax Lessonii.**
A. xalapensis=**Oreopanax xalapense.**
Araucaria includes *Eutacta.*
Arauja.
A. albens is the correct name of *Physianthus albens.*
A. angustifolia is the correct name of *Physianthus megapotamicus*
Arbutus.
A. alpina=**Arctostaphylos alpina.**
A. pilosa=**Pernettya pilosa.**
A. Uva-ursi=**Arctostaphylos Uva-ursi.**
Archontophœnix.
A. Alexandræ is the correct name of *Ptychosperma Alexandræ.*
A. Cunninghamiana is the correct name of *Ptychosperma Cunninghamiana.*
Arctio=**Berardia.**
Arctostaphylos should include *Comarostaphylis.*
Arctotis glutinosa=**Dimorphotheca cuneata.**
Ardisia=*Bladhia* and *Pyrgus.*
Arduina=**Carissa.**
Areca.
A. alba=**Dictyosperma album.**
A. aurea=**Dictyosperma aureum.**
A. Baueri=**Rhopalostylis Baueri.**
A. crinita=**Acanthophœnix crinita.**
A. erythropoda=**Cyrtostachys Renda.**
A. furfuracea=**Dictyosperma furfuraceum.**
A. gigantea=**Pinanga ternatensis.**
A. globosa=**Calyptrocalyx spicatus.**
A. gracilis=**Dypsis pinnatifrons.**
A. lutescens=**Chrysalidocarpus lutescens.**
A. monostachya=**Bacularia monostachya.**
A. montana=**Prestoëa montana.**
A. Nibung=**Oncosperma filamentosum.**
A. nobilis=**Nephrosperma Van Houtteanum.**
A. Normanbyi=**Ptychosperma Normanbyi.**
A. pisifera=**Dictyosperma furfuraceum.**
A. rubra (of Bory)=**Acanthophœnix rubra.**
A. rubra (of gardens)=**Dictyosperma rubrum.**
A. sapida=**Rhopalostylis sapida.**
A. sechellarum=**Stevensonia grandifolia.**
A. speciosa=**Hyophorbe amaricaulis.**
A. tigillaria=**Oncosperma filamentosum.**
A. Verschaffelti=**Hyophorbe Verschaffeltii.**
Arenaria includes, according to Bentham and Hooker, *Alsine*, *Cherleria*, *Gouffeia*, *Minuartia*, and *Mœhringia.*
Arenbergia=**Eustoma.**
Arenga=*Gomutus* and *Saguerus.*
Argemone=*Echtrus.*
Argyrochæta=**Parthenium.**
Argyrophyton Douglasii=**Argyroxyphium sandwicense.**
Argyroxyphium=*Argyrophyton.*
Aria Hostii=**Pyrus Chamæmespilus Hostii.**
Arisarum proboscideum is the correct name of *Arum proboscideum.*
Aristomenia=**Stifftia.**
Aristotela=**Othonna.**
Aristotelea=**Spiranthes.**
Aristotelia=*Friesia.*
Armeniaca is now included, by Bentham and Hooker, under **Prunus.**
Armeria=*Statice* (in part).
Armeriastrum=**Acantholimon.**
Armoracia is included under **Cochlearia.**
Arnebia=*Dioclea*, *Meneghinia*, *Stenosolenium*, *Strobila*, *Toxostigma.*
Aroideæ is the correct name of *Araceæ.*
Aronia=**Amelanchier.**
Arracacha. Correct name is **Arracacia.**
Arracacia is the correct name of *Arracacha.*
Arrhostoxylum is included under **Ruellia.**
Artanema=*Achimenes* (of Vahl) and *Diceros.*
Artemisia includes *Absinthium.*
Arthrochilus=**Drakæa.**
Arthrophyllum=**Phyllarthron.**
Arthopteris tenella=**Polypodium tenellum.**
Arthrostemma=*Heteronoma.*
Arthrostemma (§ *Brachyotum*)=**Brachyotum.**
Arthrozamia=**Encephalartos.**
Artocarpus=*Polyphema*, *Radermachia*, *Rima*, and *Sitodium.*
A. Cannoni. Correct name is **Ficus Cannoni.**
Aruba=**Almeidea.**
Arum.
A. campanulatum=**Amorphophallus campanulatus.**
A. crinitum=**Helicodiceros crinitus.**
A. divaricatum=**Typhonium divaricatum.**
A. flagelliforme=**Typhonium cuspidatum.**
A. helleborifolium=**Xanthosoma helleborifolium.**
A. muscivorum=**Helicodiceros crinitum.**
A. orixense=**Typhonium trilobatum.**
A. proboscideum. Correct name is **Arisarum proboscideum.**
A. spirale=*Cryptocoryne spiralis.*
A. trilobatum=**Typhonium divaricatum.**
A. t. auriculatum=**Typhonium divaricatum.**
A. triphyllum=**Arisæma triphylla.**
Arundinaria=*Ludolfia*, *Macronax*, *Miegia*, and *Triglossum.*
A. Maximowiczii=**Bambusa Maximowiczii.**
Arundo=*Amphidonax*, *Donax*, and *Scolochloa.*
Arytera=**Ratonia.**
Asaphes=**Morina.**
Asarina is included under **Antirrhinum.**
Asarum=*Heterotropa.*
A. japonicum=*Heterotropa asaroides.*
Ascaricida is included under **Vernonia.**
Ascium=**Norantea.**
Asimina=*Orchidocarpum.*
Aspalathus includes *Sarcophyllus.*
Asparagus should include *Myrsiphyllum.*
Aspegrenia=**Octomeria.**
Asperifoliæ is included under **Borragineæ.**
Asphodeline=*Dorydium.*
Asphodelopsis=**Chlorophytum.**
Asphodelus.
A. tauricus=**Asphodeline taurica.**
A. tenuior=**Asphodeline tenuior.**
Aspidistra (=*Macrogyne*, and *Porpax* of Salisbury) includes *Plectogyne.*

Synonyms and Cross-references—*continued.*

Aspidium includes *Melanopteris* and *Phanerophlebia.*
A. truncatulum = Didymochlæna lunulata.
Asplenium includes *Callipteris, Lotzea, Oxygonium, Thamnopteris,* and *Triblemma.*
Astelma should be included under **Helipterum.**
A. canescens = Helipterum canescens.
A. speciosissimum. Correct name is **Helipterum speciosissimum.**
Aster (= *Pinardia*) includes, according to Bentham and Hooker, *Bellidiastrum, Diplopappus,* and *Tripolium.*
A. albescens = *Microglossa albescens.*
A. hispidus = Heteropappus hispidus.
Asteranthemum = Smilacina.
Asteridia = Athrixia.
Asteriscus (of Mœnch) = **Odontospermum.**
Asteriscus (of Schultz "Bipontinus") = **Pallenis.**
Asteropterus = Leyssera.
Asterostigma is included under **Staurostigma.**
Astilbe = *Hoteia.*
A. japonica variegata = *Spiræa reticulata.*
Astrocaryum.
A. Borsignyanum = Stevensonia grandifolia.
A. pictum = Stevensonia grandifolia.
Astroloma longiflorum is the correct name of *Stenanthera ciliata.*
Asystasia (= *Henfreya*) includes, according to Bentham and Hooker, *Dicentranthera* and *Mackaya.*
A. bengalensis is the correct name of *Thyrsacanthus indicus.*
Ataccia = Tacca.
Atalanta = *Peritoma* (now included under **Cleome**).
Atalanthus is included under **Sonchus.**
Atalantia (= *Chilocalyx*) includes, according to Bentham and Hooker, *Severinia.*
Athalmus = Pallenis.
Atherurus = Pinellia.
Athlianthus = Justicia.
Athrixia = *Asteridia.*
Athruphyllum = Myrsine.
Aubletia (of Gærtner) = **Sonneratia.**
Aubletia (of Loureiro) = **Paliurus.**
Audibertia (in part) = **Mentha.**
Augea (of Retzius) = **Lanaria.**
Aulacophyllum.
A. Ortgiesi = Zamia Chigua.
A. Skinneri = Zamia Skinneri.
Aulacospermum = Pleurospermum.
Aureliana (of Sendtner) = *Witheringia.* Correct name is now **Bassovia.**
Axillaria = Polygonatum.
Azalea procumbens = Loiseleuria procumbens.
Azeredia = Cochlospermum.
Babingtonia should be included under **Bæckea.**
Baconia = Pavetta.
Bactris Gasipaés = Guilielma speciosa.
Bacularia = *Linospadix.*
Badamia is included under **Terminalia.**
Bæckea should include *Babingtonia.*
Bæria = *Burrielia* (in part).
Bahia = *Phialis* and *Trichophyllum.*
Balanopteris = Heritiera.
Balantium (of Desvaux) = **Parinarium.**
Balbisia = *Cruckshanksia.*
Balbisia (of Willdenow) = **Tridax.**
Balfouria = Wrightia.
Balsamifluæ is included under **Hamamelideæ.**
Balsamina hortensis = Impatiens Balsamina.
Balsamita vulgaris = Tanacetum Balsamita.
Balsamodendron = *Commiphora* and *Heudelotia.*
Bambos = Bambusa.
Bambusa = *Bambos.*
B. gracilis = Arundinaria falcata.
B. Simonii = Arundinaria Maximowiczii.
Banksea = Costus.
Banksia (of Forster) = **Pimelea.**
Barbacenia squamata = Vellozia squamata.
Barbula = Caryopteris.
Barkeria Lindleyana. Correct name is **Epidendrum Lindleyanum.**
Barkhausia rubra = Crepis rubra.
Barlia is included under **Orchis.**
Barnadesia = *Xenophonta.*
Barnardia is included under **Scilla.**
Barosma = Parapetalifera.
Barraldeia = Carallia.
Barringtoniaceæ is included under **Myrtaceæ.**
Barrotia Pancheri = Pandanus Pancheri.
Bartlingia = Plocama.
Bartolina = Tridax.
Basela is another spelling of **Basella.**
Basella. *Basela* is another spelling.
Basilæa = Eucomis.
Bassia = *Dasyaulus.*
Bassovia is the correct name of *Witheringia.*
Basteria = Berkheya.
Batatas is included under **Ipomœa.**
B. bignonioides. Correct name is **Ipomœa bignonioides.**
B. edulis. Correct name is **Ipomœa Batatas.**
Batemannia Beaumontii = Zygopetalum Beaumontii.
Batschia Gmelini = Lithospermum hirtum.
Beatonia purpurea = Tigridia violacea.
Beatsonia portulacifolia = Frankenia portulacifolia.
Beaufortia includes *Schizopleura.*
Beauharnoisia = Tovomita.
Becium is included under **Ocimum.**
Beera = Hypolytrum.
Beethovenia = Ceroxylon.
Befaria = *Acunna.*
Belamcanda = *Pardanthus.*
Belantheria = Brillantaisia.
Belenia = Physochlaina.
Belis = Cunninghamia.
Bellardia (of Schreber) = **Manettia.**
Bellidiastrum is included, by Bentham and Hooker, under **Aster.**
Bellinia = Saracha.
Belonites = Pachypodium.
Belvala = Struthiola.
Belvisia = Napoleona.
Belvisiaceæ is included under **Myrtaceæ.**
Bennetia = Saussurea.
Bentinckia Renda = Cyrtostachys Renda.
Benzoin is included under **Lindera.**
Berardia = *Arctio* and *Villaria.*
Berchemia = *Œnoplea.*
Berkheya (= *Agriphyllum, Basteria, Crocodiloides, Gorteria, Rohria,* and *Zarabellia*) includes *Stobœa.*
Berrebera = Milletia.
Berteroa is included under **Alyssum.**
Bertolonia primulæflora = Monolena primulæflora.
Besleria pulchella = Tussacia pulchella.
Bessera = *Pharium.*
Betonica.
B. hirsuta = Stachys densiflora.
B. officinalis = Stachys Betonica.
Biarum includes, according to Bentham and Hooker, *Ischarum.*
Bicorona = Melodinus.
Bidens = Pluridens.
Bifolium = Maianthemum.
Bigelovia (of Sprengel) = **Spermacoce.**
Bignonia.
B. grandiflora = Tecoma grandiflora.
B. incisa = Tecoma stans apiifolia.
B. Pandorea = Tecoma australis.
B. undulata = Tecoma undulata.
B. venusta = *Pyrostegia ignea.*
Billardiera = *Labillardiera.*
Billbergia.
B. bivittata = Cryptanthus bivittatus.
B. Brongniarti = Portea kermesina.
B. fasciata = Æchmea fasciata.
B. polystachys = Æchmea distichantha.
B. sphacelata = Greigia sphacelata.
Biota pendula = Thuya orientalis pendula.
Birchea = Luisia.
Blackburnia pinnata = Zanthoxylum Blackburnia.
Bladhia = Ardisia.
Blakea = *Valdesia.*
Blancoa (of Blume) = **Didymosperma.**
Blechnum includes *Salpichlæna.*
Bleekeria = Ochrosia.
Bletia = *Gyas* and *Thiebautia.*
B. Tankervilliæ = Phaius grandifolius.
B. Woodfordii = Phaius maculatus.
Bloomeria aurea = Nothoscordum aureum.
Blumenbachia (of Koeler) = **Sorghum.**

Synonyms and Cross-references—*continued.*

Blumia = **Saurauja.**
Bœhmeria = *Duretia* and *Splitgerbera.*
Bœnninghausenia albiflora is the correct name of *Ruta albiflora.*
Boldea = **Peumus.**
Bomarea = *Danbya* and *Vandesia.*
Bombax Gossypium = **Cochlospermum Gossypium.**
Bonapartea (of Willdenow) = *Littæa* (now included under **Agave**).
Bonaveria = **Securigera.**
Bonjeania is included under **Dorycnium.**
Bonnetia = *Kieseria.*
Boopideæ is included under **Calycereæ.**
Borago = *Borrago.*
B. orientalis = **Trachystemon orientalis.**
Borassus = *Lontanus.*
Borkhausenia = **Teedia.**
Borraginoides = **Trichodesma.**
Borrago = **Borago.**
Boscia = *Podoria.*
Bossiæa includes *Lalage.*
Boswellia = *Plœsslia.*
Bothriochilus = **Cœlia.**
Botryanthus is included under **Muscari.**
Botryodendron = **Meryta.**
Bottionea thysanotoides is the correct name of *Trichopetalum stellatum.*
Boucerosia = *Apteranthes, Desmidorchis,* and *Hutchinia.*
Bouchea includes *Chascanum.*
Bougainvillæa = *Josepha.*
Bouvardia = *Æginetia.*
Bowiea (of Haworth) is now included, by Bentham and Hooker, under **Aloe.**
Brabeium = *Brabyla.*
Brabyla = **Brabeium.**
Brachyachiris = **Gutierrezia.**
Brachychiton.
B. Bidwilli. Correct name is **Sterculia Bidwilli.**
B. diversifolium. Correct name is **Sterculia diversifolia.**
Brachylæna = *Oligocarpha.*
Brachyloma (of Hanstein) is included under **Isoloma.**
Brachyotum = *Arthrostemma* (§ *Brachyotum*).
Brachyrhynchos is included under **Senecio.**
B. albicaulis = **Senecio diversifolius pinnatifidus.**
Brachyris = **Gutierrezia.**
Brachyspatha should be included under **Amorphophallus.**
Bradleia is included under **Phyllanthus.**
Brahea edulis = **Erythea edulis.**
Brasenia peltata is the correct name of *Hydropeltis purpurea.*
Brassavola elegans = **Tetramicra rigida.**
Braunea (in part) = **Tiliacora.**
Bravoa = *Cætocapnia.*
Brehmia = **Strychnos.**
Brexia = *Venana.*
Brignolia = **Isertia.**
Brillantaisia = *Belantheria* and *Leucorhaphis.*
Brocchia (of Mauri) = **Simmondsia.**
Brodiæa includes, according to Bentham and Hooker, *Calliprora, Hesperoscordum,* and *Triteleia.*
Bromelia = *Agallostachys.*
B. amazonica = **Disteganthus scarlatinus.**
B. bicolor = *Rhodostachys bicolor.*
B. carnea = **Rhodostachys andina.**
B. undulata = **Ananas macrodonta.**
Brongniartia includes *Peraltea.*
Brosimum = *Galactodendron* and *Piratinera.*
Brotera (of Cavanilles) = **Melhania.**
Brucea = *Nima.*
Brugmansia candida = **Datura arborea.**
Bruinsmania = **Isertia.**
Brunella is the correct name of *Prunella.*
Bryonopsis laciniosa = **Bryonia laciniosa.**
Bryophyllum = **Physocalycium.**
Bubania = **Limoniastrum.**
Bubon (of Linnæus) is included under **Seseli.**
Bucephalon = **Trophis.**
Buceras is included under **Terminalia.**
Buchingera = **Cuscuta.**
Buchosia = **Heteranthera.**
Buddleia = *Romana.*
Buekia = **Alpinia.**
Buena (of Pohl) = **Cosmibuena.**
Buettneria (= *Buttneria* and *Byttneria*) includes *Pentaceros.*
Buglossum = **Anchusa.**
Bulbinella is the correct name of *Chrysobactron.*
Bulbophyllum (= *Diphyes* and *Gersinia*) includes *Malachadenia.*
Bulbospermum = **Peliosanthes.**
Bulliarda is included under **Tillæa.**
Bulöwia = **Smeathmannia.**
Bumalda = **Staphylea.**
Buphthalmum includes *Telekia.*
Burchardia (of Duhamel) = **Callicarpa.**
Burgsdorffia = **Sideritis.**
Buroma Guazuma = **Guazuma ulmifolia.**
Burrielia = **Bæria.**
Bursera includes *Icica.*
Busbeckea = **Salpichroa.**
Buttneria = **Buettneria.**
Buxaceæ is included under **Euphorbiaceæ.**
Byttneria = **Buettneria.**
Caballeria = **Myrsine.**
Cacalia salicina = **Bedfordia salicina.**
Cacao = **Theobroma.**
Cacara = **Pachyrhizus.**
Cacoucia = *Schousbœa.*
Cactus.
C. phyllanthoides = **Phyllocactus phyllanthoides.**
C. Phyllanthus = **Phyllocactus Hookeri.**
Cadamba is included under **Guettarda.**
Cæsalpinia includes *Guilandina.*
C. lacerans = **Pterolobium indicum.**
C. pulcherrima = **Poinciana pulcherrima.**
Cætocapnia = **Bravoa.**
Cainito = **Chrysophyllum.**
Caladenia includes *Leptoceras.*
C. major = **Glossodia major.**
C. minor = **Glossodia minor.**
Caladium.
C. pedatum = **Philodendron laciniatum.**
C. petiolatum = **Anchomanes Hookeri.**
C. zamiæfolium = **Zamioculcas Loddigesii.**
Calamosagus = **Korthalsia.**
Calanchoë = **Kalanchoë.**
Calanthe = *Amblyglottis, Centrosis, Ghiesbreghtia, Preptanthe,* and *Styloglossum.*
C. viridi-fusca = **Tainia latifolia.**
Calathea.
C. chimboracensis = **Maranta chimboracensis.**
C. colorata = **Phrynium coloratum.**
C. majestica = **Maranta ornata majestica.**
C. smaragdina = **Maranta smaragdina.**
Calceolaria includes *Jovellana.*
Caldcluvia = *Dieterica.*
Calea (of Gærtner) = *Neurolæna.*
C. aspera = **Melanthera deltoidea.**
Caleana = *Caleya.*
Calendula = *Caltha* (of Mœnch).
C. chrysanthemifolia = **Dimorphotheca chrysanthemifolia.**
C. graminifolia = **Dimorphotheca graminifolia.**
C. Tragus = **Dimorphotheca Tragus.**
Caleya = **Caleana.**
Caliphruria.
C. Hartwegiana. Correct name is **Eucharis Hartwegiana.**
C. subedentata. Correct name is **Eucharis subedentata.**
Calla = *Provenzalia.*
C. æthiopica = **Richardia africana.**
Callianassa = **Isoplexis.**
Calliandra = *Anneslea.*
Callicarpa = *Burchardia, Porphyra,* and *Spondylococca.*
Callichroa platyglossa. Correct name is **Layia platyglossa.**
Callicocca (of Schreber) = **Cephaëlis.**
Callicoma = *Calycomis.*
Callicornia = **Leyssera.**
Callicysthus = **Vigna.**
Calliglossa is included under **Layia.**
Calligonum = *Calliphysa.*
Calliphysa = **Calligonum.**
Calliprora is included, by Bentham and Hooker, under **Brodiæa.**
C. lutea = **Milla ixioides.**
Callirhoë.
C. digitata = **Nuttallia digitata.**
C. involucrata = **Malva involucrata.**
C. spicata = **Sidalcea malvæflora.**
Callista = **Dendrobium.**
Callistachys lanceolata = **Oxylobium Callistachys.**
Callistemon includes *Metrosideros* (in part).
Callithauma is included under **Stenomesson.**
Callixene polyphylla = **Luzuriaga erecta.**

Synonyms and Cross-references—*continued.*

Calobotrya is included under **Ribes.**
Calochortus = *Cyclobothra.*
Calodendron = *Pallasia* (of Houttuyn).
Calomeria = **Humea.**
Calopogon = *Cathea.*
Calosacme = **Chirita.**
Caloscordum nerinæflorum. Correct name is **Nothoscordum neriniflorum.**
Calothamnus = *Billottia.*
Calpidia = **Pisonia.**
Caltha (of Mœnch) = **Calendula.**
Calycanthus præcox = **Chimonanthus fragrans.**
Calycium = **Heterotheca.**
Calycomis (of Brown) = **Callicoma.**
Calycomis (of Don) = **Acrophyllum.**
Calycostemma is included under **Isoloma.**
Calycothrix = **Calythrix.**
Calydermos (of Ruiz and Pavon) = **Nicandra.**
Calymenia = **Oxybaphus.**
Calyplectus = **Lafoënsia.**
Calypso = *Cytherea, Norna,* and *Orchidium.*
Calysaccion = **Ochrocarpus.**
Calythrix (also spelt *Calytrix*) = *Calycothrix.*
Calytrix. Another spelling of **Calythrix.**
Calyxhymenia = **Oxybaphus.**
Camassia = *Cyanotris* and *Sitocodium.*
Cambogia = **Garcinia.**
Cameraria dubia = **Wrightia dubia.**
Campanea includes *Capanea.*
Campanula.
C. aurea = **Musschia aurea.**
C. capensis = **Wahlenbergia capensis.**
C. capillaris = **Wahlenbergia gracilis.**
C. gracilis = **Wahlenbergia gracilis.**
C. hederacea = **Wahlenbergia hederacea.**
Campsidium should be included under **Tecoma.**
C. chilense = **Tecoma valdiviana.**
Campylanthera (of Hooker) = **Pronaya.**
C. Fraseri = **Pronaya elegans.**
Campylia is included under **Pelargonium.**
Campylocentron is the correct name of *Todaroa.*
Campyloneuron rigidum = **Polypodium lucidum.**
Canala = **Spigelia.**
Canaria. *See* **Canarina.**
Canarina (*Canaria* is an erroneous rendering of the name) = *Pernettya* (of Scopoli).
Canarium = *Colophonia.*
Canavali = **Canavalia.**
Canavalia. Also spelt *Canavali.*
Candollea (of Labillardière), in part = **Stylidium.**
Canella = *Winterana.*
Canicidia = **Rourea.**
Canistrum is now included, by Bentham and Hooker, under **Æchmea.**
Canscora (= *Cobamba* and *Pladera*) includes *Phyllocyclus.*
Canthium = **Plectronia.**
Capanea is included under **Campanea.**
Capia = **Lapageria.**
Capnorchis = **Dicentra.**
Capparis heteroclita = **Mærua oblongifolia.**
Caproxylon = **Hedwigia.**
Caraguata, according to Bentham and Hooker, includes *Massangea.*
C. serrata = **Karatas Scheremetiewi.**
Carallia = *Barraldeia, Diatoma, Petalotoma,* and *Symmetria.*
Carapichea = **Cephaëlis.**
Carbenia benedicta is the correct name of *Cnicus benedictus.*
Cardamine includes *Dentaria* and *Pteroneuron.*
Cardamomum = **Elettaria.**
Carduncellus = *Onobroma* (of Gærtner).
Carelia = **Ageratum.**
Carica includes *Papaya* and *Vasconcellea.*
Carissa = *Arduina.*
C. Arduina = *Arduina bispinosa.*
Carpolysa = *Hessea.*
Carpopogon = **Mucuna.**
Carum includes *Zizia.*
Carumbium (of Kurz) = **Sapium.**
Carumbium (of Reinwardt) = **Homalanthus.**
Caruncularia is included under **Stapelia.**
C. pedunculata = **Stapelia lævis.**
Carya = *Hicorias* and *Scorias.*
Caryocar = *Rhizobolus.*
Caryopteris = *Barbula* and *Mastacanthus.*
Caryotaxus = **Torreya.**
Cascarilla grandiflora = **Cosmibuena obtusifolia latifolia.**
Casselia = **Mertensia.**
Cassida = **Scutellaria.**
Cassine = *Maurocenia.*
Cassiniaceæ is included under **Compositæ.**
Cassipoureæ is included under **Rhizophoreæ.**
Cassuvium = **Anacardium.**
Cassythaceæ is included under **Laurineæ.**
Castalia = **Nymphæa**
Castaneaceæ is included under **Cupuliferæ.**
Castra = **Trixis.**
Catachætum = **Catasetum.**
Catakidozamia is included under **Macrozamia.**
Catappa is included under **Terminalia.**
Cataria = **Nepeta.**
Catasetum (= *Catachætum*) includes *Monachanthus.*
Catha = *Methyscophyllum* and *Trigonotheca.*
Cathea = **Calopogon.**
Catimbium = **Alpinia.**
Catopsis = *Pogospermum* and *Tussacia.*
Cattleya coccinea = **Sophronitis grandiflora.**
Ceanothus laniger = **Pomaderris lanigera.**
Cebatha = **Cocculus.**
Cedonophora = **Paliavana.**
Celosia = *Sukana.*
Celsia includes *Ianthe.*
Celtideæ is a tribe of **Urticaceæ.**
Centaurea includes *Cyanus* and *Plectocephalus.*
Centauridium = **Xanthisma.**
Centranthera is included under **Pleurothallis.**
Centranthus = *Kentranthus.*
Centrocarpha is included under **Rudbeckia.**
Centroclinium is included under **Onoseris.**
Centronia (of Don) = *Calyptraria.*
Centropogon surinamensis = *Siphocampylos surinamensis.*
Centrosis = **Calanthe.**
Ceodes = **Pisonia.**
Cephaëlis = *Callicocca, Carapichea, Cephaleis, Eurhotia, Evea,* and *Tapogomea.*
Cephalaria = *Lepicephalus* and *Succisa.*
Cephaleis = **Cephaëlis.**
Cephalina = **Sarcocephalus.**
Cephalotaxus.
C. pedunculata fastigiata = *Podocarpus koraiana.*
C. tardiva = **Taxus baccata adpressa.**
C. umbraculifera = **Torreya grandis.**
Ceraia = **Dendrobium.**
Ceraseidos is included under **Prunus.**
Cerasus includes *Laurocerasus.*
Ceratocaulos is included under **Datura.**
C. daturoides = **Datura ceratocaula.**
Ceratocephalus is included under **Ranunculus.**
Ceratochilus (of Blume) is included under **Saccolabium.**
Ceratochilus (of Lindley) = **Stanhopea.**
Ceratodactylis osmundioides = **Llavea cordifolia.**
Ceratogynum = **Sauropus.**
Ceratolobus (in part) = **Korthalsia.**
Ceratostigma plumbaginoides = **Plumbago Larpentæ.**
Cerbera should include *Tanghinia.*
C. Ahouai = **Thevetia Ahouai.**
C. dichotoma = **Tabernæmontana dichotoma.**
C. Thevetia = **Thevetia neriifolia.**
Cereus should include *Echinopsis* and *Pilocereus.*
C. latifrons = **Phyllocactus latifrons.**
C. multiplex = **Echinopsis multiplex.**
C. Phyllanthus = **Phyllocactus Phyllanthus.**
C. Royeni = **Pilocereus Curtisii.**
Ceriscus (of Nees) = **Webera.**
Ceropegia = *Systrephia.*

Synonyms and Cross-references—*continued.*

Ceroxylon = *Beethovenia* and *Klopstockia.*
C. niveum = **Diplothemium caudescens.**
Cervicina is included under **Wahlenbergia.**
Cestrum includes *Meyenia* (of Schlechtendal).
Ceterach is divided between **Asplenium** and **Gymnogramme.**
C. officinarum = **Asplenium Ceterach.**
Chadara = **Grewia.**
Chætachlæna is included under **Onoseris.**
Chætanthera includes *Proselia.*
Chætocalyx = *Rhadinocarpus.*
Chætochilus = **Schwenkia.**
Chætocladus = **Ephedra.**
Chætodiscus = **Eriocaulon.**
Chætospora is included under **Schœnus.**
Chaixia = **Ramondia.**
Chakiatella = **Wulffia.**
Chalcas = **Murraya.**
Chamæbatia foliolosa = **Spiræa Millefolium.**
Chamæbuxus is included under **Polygala.**
Chamæcistus (of S. F. Gray) = **Loiseleuria.**
Chamædorea includes *Morenia.*
C. Ghiesbreghtii = **Gaussia Ghiesbreghtii.**
Chamælaucium plumosum = **Verticordia Fontanesii.**
Chamæpithys is included under **Ajuga.**
Chamæranthemum.
C. igneum = *Stenandrium igneum.*
C. nitidum = **Ebermaiera nitida.**
Chamæriphes = **Chamærops.**
Chamærops = *Chamæriphes.*
C. excelsa = **Trachycarpus excelsus.**
C. Fortunei = **Trachycarpus excelsus**
C. Hystrix = **Rhapidophyllum Hystrix.**
C. khasyana = **Trachycarpus khasyanus.**
C. Martianus = **Trachycarpus Martiana.**
C. Palmetto = **Sabal Palmetto.**
C. stauracantha = **Acanthorhiza aculeata.**
Chamæstephanum is included under **Schkuhria.**
Chamomilla (in part) is included under **Anthemis.**
Chasmanthium = **Uniola.**
Chavalliera Veitchii = **Æchmea Veitchii.**
Chayota = **Sechium.**
Cheilanthes includes *Myriopteris, Plecosorus,* and *Schizopteris.*
C. pulveracea = **Nothochlæna sulphurea.**
Cheiloplecton is included under **Pellæa.**
Cheilosandra = **Rhynchotechum.**
Cheiranthodendron = **Cheirostemon.**
Cheiranthus alpinus = **Erysimum alpinum.**
Cheiroglossa is included under **Ophioglossum.**
Cheirostemon = *Cheiranthodendron.* ORD. *Sterculiaceæ* (not *Malvaceæ*).
Cheirostylis marmorata. Correct name is **Dossinia marmorata.**
Chelonanthera (in part) = **Cœlogyne.**
Chelone.
C. centranthifolia = **Pentstemon centranthifolius.**
C. Digitalis = **Pentstemon lævigatus Digitalis.**
C. ruelloides = **Pentstemon barbatus.**
Cherleria is now included, by Bentham and Hooker, under **Arenaria.**
Chiazospermum is included under **Hypecoum.**
Chiliandra = **Rhynchotechum.**
Chiliophyllum (of De Candolle) is included under **Zaluzania.**
Chilocalyx (of Turczaninow) = **Atalantia.**
Chilodia is included under **Prostanthera.**
Chilostigma = **Ohlendorffia.**
Chiococca = *Siphonandra.*
Chirita (= *Calosacme*) includes *Liebigia.*
Chlamydostylis = **Nemastylis.**
Chlamysporum = **Thysanotus.**
Chlidanthus = *Coleophyllum.*
Chloöpsis = **Ophiopogon.**
Chlorophytum = *Asphodelopsis, Hartwegia,* and *Schidospermum.*
Choisya = *Juliana.*
Chomelia (of Jacquin) = *Anisomeris.*
Chomelia (of Linnæus) = **Webera.**
Chondrodendron tomentosum = **Pareira Brava.**
Chondrorhynca fimbriata = **Stenia fimbriata.**
Choretis is included under **Hymenocallis.**
C. glauca = *Hymenocallis Choretis.* The correct name is **Hymenocallis glauca.**
Choristes = **Deppea.**
Chorizema spartioides = **Isotropis striata.**
Chrysalidocarpus lutescens = *Hyophorbe Commersoniana* and *H. indica.*
Chrysanthemum includes *Ismelia.*
Chryseis = **Eschscholtzia.**
Chrysiphiala is included under **Stenomesson.**
Chrysobactron. The correct name is **Bulbinella.**
Chrysobaphus = **Ancectochilus.**
Chrysobotrya is included under **Ribes.**
Chrysophyllum = *Cainito* and *Nycterisition.*
C. imperiale = **Theophrasta imperialis.**
Chrysorrhoë is included under **Verticordia.**
Chrysostemma = **Coreopsis.**
Chrysothemis = **Tussacia.**
Chrysoxylon = **Pogonopus.**
Chthamalia = **Lachnostoma.**
Chylodia = **Wulffia.**
Ciconium is included under **Pelargonium.**
Cienfuegia = **Fugosia.**
Cienfugosia = **Fugosia.**
Ciliaria is included under **Saxifraga.**
Cinchona = *Kinkina.*
Cineraria = *Xenocarpus.*
C. gigantea = **Senecio Smithii.**
Cinnamomum should include *Camphora.*
C. Camphora is the correct name of *Camphora officinalis.*
Cipura = *Marica* (of Schreber).
C. martinicensis = **Trimezia martinicensis.**
Cirrhopetalum = *Hippoglossum* and *Zygoglossum.*
Cissus.
C. albo-nitens = **Vitis albo-nitens.**
C. amazonica = **Vitis amazonica.**
C. antarctica = **Vitis antarctica.**
C. chontalensis = **Vitis chontalensis.**
C. Davidiana = **Vitis Davidiana.**
C. japonica = **Vitis japonica.**
C. javalensis = **Vitis javalensis.**
C. Lindeni = **Vitis Lindeni.**
C. platanifolia = **Vitis Davidiana.**
C. porphyrophyllus = **Piper porphyrophyllum.**
C. rubricaulis = **Vitis Davidiana.**
C. viticifolia = **Ampelopsis serjaniæfolia.**
Cistella = **Geodorum.**
Cistus includes *Halimium.*
Citronella = **Villaresia.**
Cladobium = **Scaphyglottis.**
Clappertonia = **Honckenya.**
Clarckia = **Clarkia.**
Clarionea = **Perezia.**
Clarkia (wrongly spelt *Clarckia*) includes *Phœostoma.*
Clavija = *Horta* and *Zacintha* (of Vellozo).
C. Reideliana = *Theophrasta macrophylla.*
Cleisostoma = *Pomatocalpa.*
Cleistes is included under **Pogonia.**
Cleitria = **Venidium.**
Clematis includes *Viorna* and *Viticella.* *Atragene* is merged in this genus by Bentham and Hooker.
Cleome lutea = **Peritoma aurea.**
Cleophora = **Latania.**
Clerodendron = *Volkameria.*
Clianthus = *Donia.*
Clidemia = *Staphidium* (for the most part).
Cliftonia ligustrina is the correct name of *Mylocaryum ligustrinum.*
Clintonia (of Rafinesque) = *Xeniatrum.*
Clitanthus is included under **Stenomesson.**
Clitoria (= *Nauchea*) includes *Ternatea.*
C. multiflora = **Vilmorinia multiflora.**
C. polyphylla = **Barbieria polyphylla.**
Clivia. Bentham and Hooker regard *Himantophyllum* and *Imantophyllum* as synonymous with this.
Clusieæ is a tribe of **Guttiferæ.**
Clutia = **Cluytia.**
Cluytia = *Altora. Clutia* is another spelling.
Clynostylis = **Gloriosa.**
Clypea = **Stephania.**
Cnemidia = **Tropidia.**

Synonyms and Cross-references—*continued.*

Cnidium = **Selinum.**
Cobamba = **Canscora.**
Coccocipsilum = **Coccocypselum.**
Coccocypselum (also spelt *Coccocipsilum*) = *Condalia, Lipostoma, Sicelium,* and *Tontanea.*
Coccoloba platyclada = **Muehlenbeckia platyclada.**
Cocculidium = **Cocculus.**
Cocculus = *Cebatha, Cocculidium, Epibaterium, Leœba,* and *Wendlandia* (of Willdenow).
Cochlearia includes *Armoracia.*
Cochlospermeæ is included under **Bixineæ.**
Cochlospermum = *Azeredia, Maximiliana,* and *Wittelsbachia.*
Cocos Normanbyi = **Ptychosperma Normanbyi.**
Codonium = **Schœpfia.**
Cœlestina is now included under **Ageratum.**
Cœlia = *Bothriochilus.*
Cœloglossum is included under **Habenaria.**
Cœlogyne (= *Acanthoglossum* and *Chelonanthera*) includes *Neogyne.*
C. coronaria = **Trichosma suavis.**
Cœlostylis = **Spigelia.**
Coix = *Lithagrostis.*
Cola = *Lunanea* and *Siphoniopsis.*
Colbertia coromandelina = **Dillenia pentagyna.**
Colchicum montanum = **Merendera Bulbocodium.**
Coleophyllum = **Chlidanthus.**
Coleosporium is included under **Peridermium.**
Coleus barbatus = *Plectranthus Forskolei.*
Colladonia (of Sprengel) = **Palicourea.**
Collania (of Herbert) is included under **Bomarea.**
Collania (of Schultes) = **Urceolina.**
C. urceolata = **Urceolina pendula.**
Colophonia = **Canarium.**
Columella (of Vellozo) = **Pisonia.**
Coluria = *Laxmannia.*
Colysis membranacea = **Polypodium hemionitideum.**
Comarostaphylis should now be included under **Arctostaphylos.**
Comarum should now be included under **Potentilla.**
Comatoglossum = **Talisia.**
Combretum.
C. grandiflorum = *Poivrea grandiflora.*
C. purpureum = **Poivrea coccinea.**
Commelina = *Ananthopus, Exlebia,* and *Hedwigia.*
Commianthus = **Retiniphyllum.**
Commiphora = **Balsamodendron.**
Compositæ = *Synantherœ.*
Compsanthus = **Tricyrtis.**
Compsoa = **Tricyrtis.**
Conanthera = *Cumingia.*
Conchium = **Hakea.**
Condalia = **Coccocypselum.**
Conium Arracacha = **Arracacha esculenta.**
Conocarpus (of Adanson) = **Leucadendron.**
Conoclinium = **Eupatorium.**
Conophallus is included under **Amorphophallus.**
Conopharyngia is included under **Tabernæmontana.**
Conotrichia = **Manettia.**
Convallaria.
C. bifolia = **Maianthemum bifolium**
C. multiflora = **Polygonatum multiflorum.**
C. Polygonatum = **Polygonatum officinale.**
C. verticillata = **Polygonum verticillatum.**
Convolvulus includes *Rhodorhiza.*
C. purpurea = **Ipomœa purpurea.**
Conyza = *Eschenbachia.*
Conyza, of Schultz "Bipontinus" (in part) = **Pluchea.**
Cookia (of Gmelin) = **Pimelea.**
Cooperia includes *Sceptranthus.*
Coprosma = *Marquisia.*
Corchorus = *Mœrlensia.*
Corcovadense crispum = **Blechnum braziliense.**
Cordiera = **Alibertia.**
Cordyline = *Tœtsia.*
Corema = *Euleucum, Oakesia* (of Tuckerman), and *Tuckermannia.*
Coreopsis = *Calliopsis, Chrysostemma,* and *Diplosastera.*
C. ferulæfolia = **Bidens ferulæfolia.**
Correa = *Mazeutoxeron.*
Coryanthes speciosa = **Gongora speciosa.**
Corybas = **Corysanthes.**
Corydandra = **Galeandra.**
Corynophallus is now included, by Bentham and Hooker, under **Amorphophallus.**
Corypha = *Gembanga.*
Corysanthera = **Rhynchotechum.**
Corysanthes = *Corybas* and *Nematoceras.*
Cosmea = **Cosmos.**
Cosmibuena = *Buena.*
Cosmos = *Cosmea.*
Costus = *Banksea, Gissanthe, Hellenia, Jacuanga, Planera* (of Giseke), and *Tsiana.*
Coublandia = **Muellera.**
Crantzia (of Scopoli) = **Alloplectus.**
Craspedolepis = **Restio.**
Crassina = **Zinnia.**
Crassula now includes *Dasystemon, Globulea, Kalosanthes, Septas* (of Linnæus), and *Turgosea. Rochea* should not be included here.
C. jasminea. Correct name is **Rochea jasminea.**
C. odoratissima = **Rochea odoratissima.**
C. versicolor. Correct name is **Rochea versicolor.**
Cratægus.
C. arbutifolia = **Photinia arbutifolia.**
C. Chamæmespilus = **Pyrus Chamæmespilus.**
C. glabra = **Photinia serrulata.**
C. Hostii = **Pyrus Chamæmespilus Hostii.**
Craterostigma pumilum is the correct name of *Torenia auriculæfolia.*
Crawfurdia = *Crawfurdieæ, Golowninia, Pterygocalyx,* and *Trichterospermum.*
Crawfurdieæ = **Crawfurdia.**
Crepidaria = **Pedilanthus.**
Crepidium = **Microstylis.**
Crepis.
C. barbata = **Tolpis barbata.**
C. macrorhiza = **Tolpis macrorhiza.**
Crinita (of Houttuyn) = **Pavetta.**
Crinonia = **Pholidota.**
Criosanthes = **Cypripedium.**
Crociris = **Crocus.**
Crocodiloides = **Berkheya.**
Crocus = *Crociris.*
Crotalaria floribunda = **Viborgia obcordata.**
Croton includes *Tiglium.*
Cryptanthus = *Pholidophyllum.*
Cryptocoryne = *Myrioblastus.*
Cryptolobus (in part) = **Amphicarpæa.**
Cryptolobus (in part) = **Voandzeia.**
Cryptophragmia = **Gymnostachyum.**
Cryptosaccus = **Leiochilus.**
Cryptosanus = **Leiochilus.**
Cryptosorus is included under **Polypodium.**
Cryptostachys = **Sporobolus.**
Cryptostemma (= *Cynotis*) includes *Microstephium.*
Cryptostylis is the correct name of *Zosterostylis.*
Cubæa = **Tachigalia.**
Cubeba is included under **Piper.**
Cucifera = **Hyphæne.**
Cucullaria = **Vochysia.**
Cucurbitaceæ = *Nandirhobeæ.*
Cudrania trilcba is the correct name of *Maclura tricuspidata.*
Cumingia = **Conanthera.**
Cuncea = **Knoxia.**
Cunina = **Nertera.**
Cunninghamia = *Belis* and *Raxopitys.*
Cunonia (of Miller) = **Antholyza.**
Cupameni = **Acalypha.**
Cuphea includes *Melvilla.*
Cupia (for the most part) = **Randia.**
Cuprespinnata = **Taxodium.**
Cupresstellata = **Fitzroya.**
Cupressus thyoides = **Chamæcyparis sphæroidea.**
Curculigo = *Empodium, Fabricia* (of Thunberg), and *Forbesia.*
Curcuma = *Erndlia* and *Stissera.*
Curmeria is included under **Homalomena.**
Cuscuta = *Buchingera, Cuscutina, Cussutha, Engelmannia, Epilinella, Grammica, Lepidanche, Monogynella, Pfeifferia,* and *Succuta.*
Cuscutina = **Cuscuta.**
Cuspidaria is included under **Tænitis.**
Cussutha = **Cuscuta.**
Cyamus = **Nelumbium.**
Cyananthus (of Griffiths) = **Staurantbera.**
Cyanotis (= *Tonningia* and *Zygomenes*) includes *Erythrotis.*
C. cristata = **Tradescantia cristata.**
C. vittata = **Zebrina pendula.**

Synonyms and Cross-references—*continued.*

Cyanotris = **Camassia.**
Cyanus is included under **Centaurea.**
Cyathea includes *Metaxya.*
C. sinuata = **Schizocæna sinuata.**
C. Smithii = **Hemitelia Smithii.**
Cyathostyles = **Cyphomandra.**
Cybele (of Salisbury) = **Stenocarpus.**
Cybelion = **Ionopsis.**
Cyclobothra = **Calochortus.**
Cyclogyne is included under **Swainsona.**
Cyclopogon = **Spiranthes.**
Cycnoches.
C. barbatum. Correct name is **Polycycnis barbata.**
C. musciferum. Correct name is **Polycycnis muscifera.**
Cycoctonum roseum = **Cynanchum roseum.**
Cydonia is included, by Bentham and Hooker, under **Pyrus.**
Cylicadenia = **Odontadenia.**
Cymation = **Ornithoglossum.**
Cymbidium = *Iridorchis.*
Cymburus = **Stachytarpheta.**
Cyminosma = **Acronychia.**
Cynanchum = *Diploglossis, Endotropis,* and *Symphyoglossum.*
C. minus = **Vincetoxicum fuscatum.**
C. nigrum = **Vincetoxicum nigrum.**
C. pilosum = **Vincetoxicum pilosum.**
C. suberosum = **Gonolobus suberosus.**
C. Vincetoxicum = **Vincetoxicum officinale.**
Cynocrambe = **Thelygonum.**
Cynotis = **Cryptostemma.**
Cypella (= *Polia*) includes *Phalocallis.*
C. brachypus = **Marica brachypus.**
C. plumbea = *Phallocallis plumbea.*
Cyperus includes *Trentepohlia.*
C. Papyrus is the correct name of *Papyrus antiquorum.*
Cyphomandra = *Cyathostyles* and *Pallavicinia.*
Cyphonema = **Cyrtanthus.**
Cypripedium = *Criosanthes.* Several plants formerly included here are now classed under **Selenipedium.**
C. Reichenbachianum = **Selenipedium longifolium.**
Cyrilla (of L'Héritier) = **Achimenes.**
Cyrta = **Styrax.**
Cyrtandraceæ is included under **Gesneraceæ.**
Cyrtanthera is included, by Bentham and Hooker, under **Jacobinia.**
Cyrtanthus = *Cyphonema, Eusipho, Gastronema, Monella,* and *Timmia.*
Cyrtanthus (of Schreber) = **Posoqueria.**
Cyrtoceras multiflorum. Correct name is **Hoya multiflora.**
Cyrtochilum.
C. citrinum. Correct name is **Oncidium citrinum.**
C. maculatum. Correct name is **Oncidium maculatum.**
Cyrtodeira is included under **Episcia.**
Cyrtomium is included under **Aspidium.**
C. caryotideum = **Aspidium falcatum caryotideum.**
C. Fortunei = **Aspidium falcatum Fortunei.**
Cyrtopodium = *Tylochilus.*
Cyrtosia = **Galeola.**
Cystanthe is included under **Richea.**
Cystidianthus = **Physostelma.**
Cystopteris spinulosa = **Asplenium spinulosum.**
Cytherea = **Calypso.**
Cytisus includes *Spartothamnus.*
Czackia = **Paradisia.**
Dacrydium = *Lepidothamnus.*
D. tetragonum = **Microcachrys tetragona.**
Dactylostyles = **Zygostates.**
Dalechampia includes *Rhopalostylis.*
Dalibarda is now included under **Rubus.**
D. fragarioides = **Waldsteinia fragarioides.**
D. repens. Correct name is **Rubus Dalibarda.**
Dalrymplea = **Turpinia.**
Damasonium (of Schreber) = **Ottelia.**
Dammara. Correct name is **Agathis.**
Danaa = **Physospermum.**
Danaë racemosa is the correct name of *Ruscus racemosus.*
Danbya = **Bomarea.**
Daphne includes *Mezereum.*
Daphniphyllaceæ is included under **Euphorbiaceæ.**
Daphnoideæ is included under **Thymelæaceæ.**
Darwinia = *Polyzone.*
Dasyaulus = **Bassia.**
Dasystemon (of De Candolle) is included under **Crassula.**
Davallia includes *Odontosoria, Saccoloma,* and *Synaphlebium.*
Decaisnea (of Brongniart) = **Prescottia.**
Decaisnea (of Lindley) = **Tropidia.**
Decaspermum = **Nelitris.**
Decaspora = **Trochocarpa.**
Demidovia = **Tetragonia.**
Dendrium = **Leiophyllum.**
Dendrobium = *Callista, Ceraia, Desmotrichum, Onychium* (of Blume), and *Pedilonum.*
Dendrochilum (in part) = **Platyclinis.**
D. squalens = **Xylobium squalens.**
D. vestitum = **Eria vestita.**
Dendrocolla = **Sarcochilus.**
Dendrolirium = **Eria.**
Denhamia = **Culcasia.**
Dennstædtia is included under **Dicksonia.**
Dentaria should be included under **Cardamine.**
Dentidia = **Perilla.**
Descantaria is included under **Tradescantia.**
Desmidorchis = **Boucerosia.**
Desmochæta is included under **Pupalia.**
Desmotrichum = **Dendrobium.**
Diacrium bicornutum is the correct name of *Epidendrum bicornutum.*
Dianella = *Rhuacophila.*
Dianthera (= *Beloperone* in part and *Rhytiglossa*) includes *Porphyrocoma.*
Diapensia barbulata = **Pyxidanthera barbulata.**
Diasia = *Melasphærula.*
Diastella = **Leucospermum.**
Diastemanthe = **Stenotaphrum.**
Diatoma = **Carallia.**
Dicentranthera is included, by Bentham and Hooker, under **Asystasia.**
Diceros (of Persoon) = **Artanema.**
Dichæa = *Fernandezia* (in part).
Dichopsis gutta = **Isonandra gutta.**
Dichorisandra = *Stickmannia.*
Dichosema is included under **Mirbelia.**
Dichroma (of Cavanilles) = **Ourisia.**
Dicksonia includes *Leptopleura* and *Patania.*
Dictyanthus = *Rytidoloma.*
Dictyopteris macrodonta = **Polypodium macrodon.**
Didymocarpus Rexii = **Streptocarpus Rexii.**
Didymochlæna includes *Sphærostephanos.*
Didymosperma = *Blancoa.*
Diellia is included under **Lindsaya.**
Dierama.
D. pendula is the correct name of *Sparaxis pendula.*
D. pulcherrima is the correct name of *Sparaxis pulcherrima.*
Dieterica = **Caldcluvia.**
Digitalis.
D. canariensis = **Isoplexis canariensis.**
D. sceptrum = **Isoplexis sceptrum.**
Dilivaria is included under **Acanthus.**
Dillwynia pungens = **Eutaxia pungens.**
Dimocarpus (in part) = **Nephelium.**
Dimorphanthus should be included under **Aralia.**
Dinetus = **Porana.**
Diosma obtusa = **Macrostylis squarrosa.**
Diotis = *Otanthus.*
Dipcadi = *Polemannia, Tricharis,* and *Zuccagnia.*
D. serotina = *Lachenalia serotina.*
Diphyes = **Bulbophyllum.**
Dipladenia flava = **Urechites suberecta.**
Diplazium.
D. decurrens = **Asplenium maximum.**
D. umbrosum = **Asplenium radicans.**
Diplecthrum = **Satyrium.**
Diplocalyx = **Mitraria.**
Diplochita is included under **Miconia.**
Diplocoma = **Heterotheca.**
Diplodium = **Pterostylis.**
Diplogastra = **Platylepis.**
Diploglossis = **Cynanchum.**

Synonyms and Cross-references—*continued.*

Diplonema elliptica = **Euclea polyandra.**
Diplonyx = **Wistaria.**
Diplophyllum is included under **Veronica.**
Diplosastera = **Coreopsis.**
Diplothemium = *Allagoptera.*
Dipodium (now the correct name) = *Wailesia.*
Disandra = **Sibthorpia.**
Disarrenum = **Hierochloë.**
Discocapnos is included under **Fumaria.**
Diselma = **Fitzroya.**
Disemma aurantia = **Passiflora Banksii.**
Disporum = *Drapieza.*
Dissochroma viridiflora = **Dyssochroma viridiflora.**
Distrepta = **Tecophilæa.**
Dolichos.
D. luteolus = **Vigna glabra.**
D. sinensis = **Vigna Catiang.**
Dombeya (of La Marck) = **Araucaria.**
Dombeya (of L'Héritier) = **Tourretia.**
Donax = **Arundo.**
Dondisia (of De Candolle) = **Plectronia.**
Dondisia (of Reichenbach) = **Hacquetia.**
Donia (of G. Don) = **Clianthus.**
Donia (of R. Brown) = **Grindelia.**
Doodia (of Roxburgh) = **Uraria.**
Dorcoceras = **Bæa.**
Doria (of Adanson) = **Solidago.**
Doria (of Lessing) is included under **Othonna.**
Doronicum Clusii = **Arnica Clusii.**
Dorstenia = *Kosaria* and *Sychinium.*
Dorydium = **Asphodeline.**
Doryopteris nobilis = **Pteris elegans.**
Douma = **Hyphæne.**
Dracæna = *Pleomele* and *Terminalis.*
D. phrynioides = *Phrynium maculatum.*
D. stricta = **Cordyline stricta.**
Dracocephalum.
D. canariense = **Cedronella triphylla.**
D. cordatum = **Cedronella cordata.**
D. denticulatum = **Physostegia virginiana denticulata.**
D. variegatum = **Physostegia virginiana.**
Dracontium now includes *Echidnium* and *Godwinia.*
Drakæa = *Arthrochilus.*
Drapieza = **Disporum.**
Drepanocarpus = *Sommerfeldtia.*
Drimia.
D. acuminiata = **Scilla lanceæfolia.**
D. altissima = **Urginea altissima.**
D. apertiflora = **Scilla lorata.**
D. Cooperi = **Scilla concolor.**
D. lanceæfolia = **Scilla revoluta.**
D. lanceolata = **Scilla lanceolata.**
Drimophyllum = **Umbellularia.**
Drimys includes *Tasmannia.*
Drummondia mitelloides = **Mitella pentandra.**
Dryandra = *Josephia.*
Duania = **Homalanthus.**
Dubreuilia = **Pilea.**
Duchekia = **Palisota.**
Duchola = **Omphalea.**
Dulia = **Ledum.**
Dumerilia (of Lessing) is included under **Perezia.**
Duperreya = **Porana.**
Duretia = **Bœhmeria.**
Duvalia Corderoyi = *Stapelia Corderoyi.*
Duvernoia = **Adhatoda.**
Dysoda = **Serissa.**
Dyssochroma.
D. eximia is the correct name of *Juanulloa eximia.*
D. viridiflora is the correct name of *Solandra viridiflora.*
Earlia = **Graptophyllum.**
E. excelsa = **Graptophyllum Earlii.**
Ecballium Elaterium = **Momordica Elaterium.**
Echinacea.
E. angustifolia. Correct name is **Rudbeckia pallida.**
E. purpurea. Correct name is **Rubus purpurea.**
Echinostachys (of Brongniart) is included under **Æchmea.**
Echinostachys (of E. Meyer) = **Pycnostachys.**
Echioides = **Nonnea.**
Echiopsis = **Lobostemon.**
Echites.
E. nutans = **Prestonia venosa.**
E. suberecta = **Urechites suberecta.**
Echtrus = **Argemone.**
Eckardia = **Peristeria.**
Eclopes = **Relhania.**
Edwardsia.
E. chilensis = **Sophora macrocarpa.**
E. Macnabiana = **Sophora tetraptera microphylla.**
E. microphylla = **Sophora tetraptera microphylla.**
Egeria = **Elodea.**
Eichhornia crassipes = *Pontederia azurea.*
Elæagnus = *Lepargyræa.*
Elæis = *Alfonsia.*
Elæodendron includes *Portenschlagia.*
E. Argan = **Argania Sideroxylon.**
E. orientale is the correct name of *Aralia Chabrierii.*
Elate = **Phœnix.**
Electrosperma = **Eriocaulon.**
Elephantusia = **Phytelephas.**
Elettaria = *Cardamomum.*
Elichrysum proliferum = **Phænocoma prolifera.**
Elisena = *Liriope* and *Liriopsis.*
Elisma natans is the correct name of *Alisma natans.*
Elodea = *Anacharis, Apalanthe, Egeria,* and *Udora.*
Elodea (of Spach) is included under **Hypericum.**
Emericia = **Vallaris.**
Empodium = **Curculigo.**
Empusa is included under **Liparis.**
Enantiosparton is included under **Genista.**
Enargea = **Luzuriaga.**
Encephalartos = *Arthrozamia.*
E. Ghellinckii = *Zamia Ghellinckii.*
E. villosus = *Zamia villosa.*
Encholirion.
E. corallinum = **Tillandsia corallina.**
E. roseum = **Tillandsia corallina rosea.**
E. sanguinolenta = **Tillandsia sanguinolenta.**
E. Saundersii = **Tillandsia Saundersii.**
Encyclia = **Polystachya.**
Endera = **Taccarum.**
E. conophalloidea = **Taccarum peregrinum.**
Endotropis = **Cynanchum.**
Enemion is included under **Isopyrum.**
Engelmannia = **Cuscuta.**
Enodium = **Molinia.**
Eopepon is included under **Trichosanthes.**
E. vitifolius = **Trichosanthes Kirilowii.**
Ephedra = *Chætocladus.*
Ephemerum = **Tradescantia.**
Epibaterium = **Cocculus.**
Epidendrum includes *Physinga.*
E. diffusum = **Seraphyta diffusa.**
E. Liliastrum = **Sobralia Liliastrum.**
E. tibicinis = **Schomburgkia tibicinis.**
Epilinella = **Cuscuta.**
Epipactis cucullata = **Eriochilus autumnalis.**
Epiphanes (of Blume) = **Gastrodia.**
Epiphyllum Phyllanthus = **Phyllocactus Phyllanthus.**
Episcia tessellata = **Centrosolenia bullata.**
Eranthemum.
E. coccineum = **Thyrsacanthus strictus.**
E. indicum = **Thyrsacanthus indicus.**
Eremophila.
E. Brownii is the correct name of *Stenochilus glaber.*
E. maculata is the correct name of *Stenochilus maculatus.*
Eremurus = *Ammolirion* and *Henningia.*
Eria (= *Dendrolirium, Octomeria* of Don, and *Pinalia*) includes *Porpax* (of Lindley).
E. coronaria = **Trichosma suavis.**
E. suavis = **Trichosma suavis.**
Erianthus = *Ripidium.*
Erica includes *Pachysa* and *Syringodea.*
E. orbicularis = **Blæria ericoides.**
E. sicula = **Pentapera sicula.**
Erigeron includes *Phalacroloma* and *Polyactidium.*
Erinacea hispanica = **Anthyllis erinacea.**
Erinus lychnidea = **Zaluzianskia lychnidea.**
Eriobotrya is included under **Photinia.**
Eriocalia = **Actinotus.**
Eriocarpha = **Montanoa.**
Eriocaulon = *Chætodiscus, Electrosperma, Lasiolepis, Leucocephala, Nasmythia, Randalia, Sphærochloa,* and *Symphachne.*
Eriogonum = *Espinosa.*
Eriopappus = **Layia.**
Eriophorum (= *Linagrostis*) includes *Trichophorum.*

Synonyms and Cross-references—*continued.*

Eriostomum = **Stachys.**
Erndlia = **Curcuma.**
Erodendron = **Protea.**
Erpetion is included under **Viola.**
E. reniforme = **Viola hederacea.**
Erxlebia = **Commelina.**
Erythrodanum = **Nertera.**
Erythrodes = **Physurus.**
Erythrorhiza = **Galax.**
Erythrotis is included under **Cyanotis.**
Erythroxylon (= *Steudelia*, of Sprengel) includes *Sethia.*
Escallonia = *Vigiera.*
Eschenbachia = **Conyza.**
Escheria = **Gloxinia.**
Espinosa = **Eriogonum.**
Ethanium = **Renealmia.**
Euchlæna = *Reana.*
Eucnemis = **Govenia.**
Eucomis = *Basilæa.*
Eudolon = **Strumaria.**
Eugenia includes *Syzygium.*
E. orbiculata = **Myrtus orbiculata.**
Euleucum = **Corema.**
Eulophia = *Orthochilus.*
E. Mackaiana = **Zygopetalum Mackayi.**
E. streptopetala = **Lissochilus streptopetala.**
Euosma = **Logania.**
Euphorbia (= *Tithymalus*) includes *Treisia.*
Euphoria (in part) = **Nephelium.**
Eurhotia = **Cephaëlis.**
Euryandra = **Tetracera.**
Eurycles = *Proiphys.*
Euryops pectinatus is the correct name of *Othonna pectinata.*
Eusipho = **Cyrtanthus.**
Eustephia coccinea = **Phædranassa rubro-viridis.**
Eustoma = *Uvananthus.*
E. exaltatum = *Lisianthus exaltatus.*
E. Russellianum = *Lisianthus Russellianus.*
Eustylis = **Nemastylis.**
Eutacta is, by Bentham and Hooker, included under **Araucaria.**
Eutaxia empetrifolia is the correct name of *Sclerothamnus microphyllus.*
Euterpe montana. Correct name is **Prestoëa montana.**
Euthamia graminifolia = **Solidago lanceolata.**
Euxenia = **Podanthus.**
E. grata = **Podanthus ovatifolius.**
Evallaria = **Polygonatum.**
Evansia is included under **Iris.**
Evea = **Cephaëlis.**
Evodia fraxinifolia is the correct name of *Tetradium trichotomum.*
Exitelia = **Parinarium.**
Exochorda grandiflora (of Hooker) = **Spiræa grandiflora.**
Exothostemon = **Prestonia.**
Eyrea = **Turpinia.**
Fabago is included under **Zygophyllum.**
F. major = **Zygophyllum Fabago.**
Fabricia (of Adanson) = **Lavandula.**
Fabricia (of Thunberg) = **Curculigo.**
Fadyenia is included under **Garrya.**
Fagara = **Zanthoxylum.**
F. microphylla = **Zanthoxylum spinifex.**
Farfugium is included under **Senecio.**
F. grande = **Ligularia Kæmpferi aureo-maculata.**
Farnesia is included under **Acacia.**
Fatræa is included under **Terminalia.**
Fedia Cornucopiæ = *Valeriana Cornucopiæ.*
Fedia (of Adanson) = **Patrinia.**
Fedia (of Gærtner), in part = **Valerianella.**
Feea.
F. nana = **Trichomanes botryoides.**
F. polypodina = **Trichomanes spicatum.**
Ferdinanda (in part) is included under **Zaluzania.**
Fernandezia (of Lindley) is now merged into **Lockhartia.**
Fernandezia (of Ruiz and Pavon), in part = **Dichæa.**
Ferraria.
F. Pavonia = **Tigridia pavonia.**
F. Trigidia = **Tigridia pavonia.**
Ferreola is included under **Maba.**
Festuca includes *Vulpia.*
Feuillæa pedata = **Telfairia pedata.**
Ficus Sycomorus = **Sycomorus antiquorum.**
Fieldia (of Gaudichaud) = **Stauropsis.**
F. lissochiloides = **Stauropsis Batemanni.**
Fischera = **Leiophyllum.**
Fissilia = **Olax.**
Fitzroya = *Cupressellata* and *Diselma.*
Flacourtia japonica = **Idesia polycarpa.**
Flaveria = *Vermifuga.*
Floërkea (of Sprengel) = **Adenophora.**
Florestina pedata is the correct name of *Stevia pedata.*
Fœtataxus = **Torreya.**
Forbesia = **Curculigo.**
Forneum = **Andryala.**
Forrestia = *Amischotolype.*
Fortunea chinensis = **Platycarya strobilacea.**
Foveolaria (of Ruiz and Pavon), in part = **Styrax.**
Frangula is included under **Rhamnus.**
Freycinetia = *Jezabel* and *Victoriperrea.*
Freziera includes *Lettsomia.*
Friedrichsthalia = **Trichodesma.**
Fritillaria includes *Rhinopetalum* and *Theresia.*
F. Hookeri. Correct name is **Lilium Hookeri.**
Frœlichia (of Mœnch) includes *Oplotheca.*
Frolovia is included under **Saussurea.**
Frutesca = **Gærtnera.**
Fuchsia (of Swartz) = **Schradera.**
Fulchironia = **Phœnix.**
Funium = **Furcræa.**
Funkia (= *Libertia* of Dumortier and *Saussurea* of Salisbury) includes *Niobe.*
Furcræa = *Funium.*
Fussia = **Aira.**
Gabertia = **Grammatophyllum.**
Gagea = *Ornithoxanthum.*
Galactodendron = **Brosimum** (according to Bentham and Hooker).
Galanga = **Alpinia.**
Galeandra = *Corydandra.*
Galedupa = **Pongamia.**
Galeobdolon is included under **Lamium.**
Galeoglossum = **Prescottia.**
Galeola = *Cyrtosia, Erythrorchis, Hæmatorchis, Ledgeria,* and *Pogochilus.*
Galeopsis (of Mœnch) = **Stachys.**
Galinsogea is included under **Tridax.**
Galvania = **Palicourea.**
Gamochlamys is included under **Spathantheum.**
Gamoplexis = **Gastrodia.**
Ganymedes is included under **Narcissus.**
G. concolor = **Narcissus triandrus concolor.**
Garciana = **Philydrum.**
Garcinia.
G. ovalifolia = **Xanthochymus ovalifolius.**
G. Xanthochymus = **Xanthochymus pictorius.**
Gardenia.
G. malleifera = **Randia malleifera.**
G. Randia = **Randia aculeata.**
G. Whitefieldii = **Randia malleifera.**
Gastonia palmata = **Trevesia palmata.**
Gastrocarpha = **Moscharia.**
Gastrodia = *Epiphanes, Gamoplexis.*
Gastromeria = **Melasma.**
Gastronema = **Cyrtanthus.**
Gaya = **Seringia.**
Geblera is included under **Securinega.**
Gela = **Acronychia.**
Gelonium is included under **Ratonia.**
Gembanga = **Corypha.**
Genetyllis tulipifera = **Darwinia macrostegia.**
Genista includes *Enantiosparton.*
Genosiris = **Patersonia.**
Gentiana (= *Selatium* and *Ulostoma*) includes *Pneumonanthe.*
Geodorum = *Cistella* and *Otandra.*
Geonoma = *Gynestum* and *Vouay.*
G. fenestrata = **Malortiea gracilis.**
G. magnifica = **Calyptrogyne Ghiesbreghtiana.**
Georgina Cervantesii = **Dahlia coccinea.**
Gerdaria = **Sopubia.**
Germanea = **Plectranthus.**
Gersinia = **Bulbophyllum.**
Gesnera includes *Rechsteinera.*
Gesneria.
G. elongata = **Isoloma Deppeanum.**
G. hondensis = **Isoloma hondense.**
G. mollis = **Isoloma molle.**
G. prasinata = **Paliavana prasinata.**
G. Seemanni = **Isoloma Seemanni.**
G. triflora = **Isoloma trifiorum.**

Synonyms and Cross-references—*continued.*

Gethyllis = *Abapus* and *Papiria.*
Gethyra = **Renealmia.**
Ghiesbreghtia = **Calanthe.**
Ghinia = **Tamonea.**
Gias = **Bletia.**
Gigantabies = **Sequoia.**
Gilliesiaceæ is included under **Liliaceæ.**
Gingidium (of Mueller) = **Aciphylla.**
Ginginsia = **Pharnaceum.**
Gissanthe = **Costus.**
Gladiolus.
G. crispus = **Tritonia crispa.**
G. lineatus = **Tritonia lineata.**
G. pyramidatus = **Watsonia rosea.**
G. sambucinus = **Babiana sambucina.**
G. securiger = **Tritonia securigera.**
Glandulifolia = **Adenandra.**
Glechoma hederacea = **Nepeta Glechoma.**
Gleichenia includes *Mecosorus* and *Mertensia* (of Willdenow).
Globba = *Hura* (of Kœnig), *Manittia*, and *Sphærocarpus.*
Gloneria is included under **Psychotria.**
Glossanthus = **Klugia.**
Glottidium floridanum = **Sesbania vesicaria.**
Gloxinia (in part) = **Sinningia.**
G. hypocyrtiflora = **Isoloma hypocyrtiflorum.**
G. Passinghamii = **Sinningia speciosa.**
Glycine includes *Soja.*
G. Apios = **Apios tuberosa.**
G. chinensis = **Wistaria chinensis.**
G. coccinea = **Kennedya prostrata.**
G. Comptoniana = **Hardenbergia Comptoniana.**
G. frutescens = **Wistaria frutescens.**
G. sinensis = **Wistaria chinensis.**
G. vincentina = **Chætocalyx vincentinus.**
Glycine (of Wight and Arnott) = **Teramnus.**
Glyptostrobus pendulus = **Taxodium distichum microphyllum.**
Gnaphalium dioicum = **Antennaria dioica.**
Godetia grandiflora = **Œnothera Whitneyi.**
Godwinia is included under **Dracontium.**
Golowninia = **Crawfurdia.**
Gomphocarpus padifolius. Correct name is **Xysmalobium padifolium.**
Gomutus = **Arenga.**
Goniopteris crenata = **Polypodium Ghiesbreghtii.**
Gonogona = **Goodyera.**
Gonostemon is included under **Stapelia.**
Goodyera = *Gonogona*, *Peramium*, and *Tussaca.*
Gorteria (of La Marck) = **Berkheya.**
Gothofreda = **Oxypetalum.**
Gouffeia is now included, by Bentham and Hooker, under **Arenaria.**
Govenia = *Eucnemis.*
Govindovia = **Tropidia.**
Grammatophyllum = *Gabertia* and *Pattonia.*
Grammica = **Cuscuta.**
Grenvillea is included under **Pelargonium.**
Grindelia coronopifolia = **Xanthocephalum centauroides.**
Grisebachia = **Howea.**
Grossularia is included under **Ribes.**
Guagnebina = **Manettia.**
Guapebe = **Lucuma.**
Guizotia is the correct name of *Veslingia.*
G. oleifera is the correct name of *Veslingia sativa.*
Gundelsheimera = **Gundelia.**
Gunnia is included under **Sarcochilus.**
Guzmania reticulata = **Tillandsia reticulata.**
Gymnogramme includes *Leptogramme.*
G. calomelanos peruviana = *G. peruviana argyrophylla* (of gardens).
G. flavens = **Nothochlæna flavens.**
G. ochracea (of gardens) = **G. tartarea.**
G. peruviana argyrophylla (of gardens) = **G. calomelanos peruviana.**
G. tartarea = *G. ochracea* (of gardens).
Gymnolomia maculatum = **Wulffia maculata.**
Gymnotheca is included under **Marattia.**
Gynandriris is included under **Iris.**
Gynestum = **Geonoma.**
Gyneteria (of Sprengel) = **Tessaria.**
Gynheteria (of Willdenow) = **Tessaria.**
Gynocephala = **Phytocrene.**
Gynoxys (in part) is included under **Senecio.**
Gypsophila includes *Struthium.*
Gyromia = **Medeola.**
Gyrostachis = **Spiranthes.**
Gyrotheca = **Lachnanthes.**
Habenaria (= *Sieberia*) includes *Peristylis.*
Hæmadictyon = **Prestonia.**
Hæmanthus includes *Nerissa.*
Hæmatorchis = **Galeola.**
Hæmocharis = **Laplacea.**
Hænkea (of Ruiz and Pavon), in part = **Maytenus.**
Hænkea (of Ruiz and Pavon), in part = **Schœpfia.**
Hænselera = **Physospermum.**
Hagæa = **Polycarpæa.**
Hamiltonia (of Muehlenbeck) = **Pyrularia.**
Haplochilus is included under **Zeuxina.**
Harpalyce (of Don) is included under **Prenanthes.**
Harrisonia (of Necker) = **Xeranthemum.**
Hartmannia is included under **Œnothera.**
Hartwegia (of Nees) = **Chlorophytum.**
Hebeandra = **Monnina.**
Hebecocca = **Omphalea.**
Hebelia = **Tofieldia.**
Hecatea = **Omphalea.**
Hechtia pitcairniæfolia = **Rhodostachys bicolor.**
Hedaroma.
H. latifolium = **Darwinia citriodora.**
H. tulipifera = **Darwinia macrostegia.**
Hedera.
H. platanifolium = **Oreopanax platanifolia.**
H. xalapensis = **Oreopanax xalapense.**
Hedwigia (of Medicus) = **Commelina.**
Hedysarum tuberosum = **Pueraria tuberosa.**
Hedyscepe Canterburyana = *Veitchia Canterburyana.*
Hekaterosachne = **Oplismenus.**
Hekorima = **Streptopus.**
Helianthus.
H. linearis = **Viguiera linearis.**
H. rigidus = *Viguiera rigida.*
H. speciosus = **Tithonia speciosa.**
H. tubæformis = **Tithonia tubæformis.**
Helichrysum includes *Pentataxis* and *Swammerdamia.*
Heligma = **Parsonsia.**
Heliotropium includes *Piptoclaina* and *Tiaridium.*
Helipterum is now included under **Helichrysum.**
H. gnaphalioides = **Leyssera squarrosa.**
H. humile = **Aphelexis humilis.**
Hellenia (of Retz) = **Costus.**
Hellenia (of Willdenow) is included under **Alpinia.**
Helmholtzia glaberrima = **Philydrum glaberrimum.**
Helonias.
H. angustifolia = **Zygadenus angustifolius.**
H. asphodeloides = **Xerophyllum asphodeloides.**
H. bracteata = **Zygadenus glaberrimus.**
H. glaberrima = **Zygadenus glaucus.**
H. graminea = **Stenanthium angustifolium gramineum.**
H. læta = **Zygadenus Muscætoxicum.**
H. l. minor = **Zygadenus angustifolius.**
H. viridis = **Veratrum album viride.**
Helygia = **Parsonsia.**
Hemicarpurus = **Pinellia.**
Hemimeris (of Humboldt, Bonpland, and Kunth) is included under **Alonsoa.**
H. coccinea = **Alonsoa linearis.**
H. urticifolia = **Alonsoa incisifolia.**
Hemisacris = **Schismus.**
Henfreya = **Asystasia.**
Henningia = **Eremurus.**
Hepatica is included under **Anemone.**
H. triloba = **Anemone Hepatica.**
Hepetis = **Pitcairnia.**
Herbertia = *Alophia.*
Heriteria (of Schrank) = **Tofieldia.**
Heritiera (of Gmelin) = **Lachnanthes.**
Heritiera (of Retzius) is now considered a synonym of **Alpinia.**
Hermodactylon is included under **Iris.**
Hernandia = *Hertelia.*
Hernandieæ. A tribe of **Laurineæ.**

Synonyms and Cross-references—*continued.*

Herpestis = *Ranaria* and *Septas* (of Loureiro).
Hertelia = **Hernandia.**
Hesiodia = **Sideritis.**
Hesperis arabidiflora = **Parrya arabidiflorum.**
Hesperocles = **Nothoscordum.**
Hesperoscordum is included under **Brodiæa.**
Hessea (of Bergius) = **Carpolyza.**
Heteranthera = *Buchosia* and *Leptanthus.*
Heterophlebium is included under **Pteris.**
Heterostalis is included under **Typhonium.**
H. Huegeliana = **Typhonium diversifolium Huegelianum.**
Heterotrichum (of Bieberstein) = **Saussurea.**
Heterotropa is now regarded as synonymous with **Asarum.**
Heudelotia = **Balsamodendron.**
Hewardia adiantoides = **Adiantum Hewardia.**
Hewittia bicolor is the correct name of *Palmia bicolor.*
Hexaglottis includes *Plantia.*
Hexorima = **Streptopus.**
Heymassoli = **Ximenia.**
Hibiscus = *Triguera.*
H. cuneiformis = **Fugosia cuneiformis.**
H. hakeæfolius = **Fugosia hakeæfolia.**
H. multifidus = **Fugosia hakeæfolia.**
Hicorias = **Carya.**
Hieracium includes *Pilosella.*
Higginsia (of Blume) = **Petunga.**
Himantoglossum is included under **Orchis.**
Himantophyllum = **Clivia.**
Himatanthus = **Plumeria.**
Hippeastrum includes *Phycella.*
Hippocastanum = **Æsculus.**
Hippoglossum (of Breda) = **Cirrhopetalum.**
Hippoglossum (of Hartmann) = **Mertensia.**
Hirculus is included under **Saxifraga.**
Hoarea is included under **Pelargonium.**
H. atra = **Pelargonium hirsutum melananthum.**
Hohenbergia.
H. capitata = **Æchmea exudans.**
H. erythrostachys = **Æchmea glomerata.**
H. Legrelliana = **Portea Legrelliana.**
Holbœllia latifolia = *Stauntonia latifolia.*
Holcochlæna is included under **Pellæa.**
Homalanthus (= *Duanis*) is also spelt *Omalanthus.*
Homeria flexuosa = **Hexaglottis longifolia.**
Homogyne alpina = *Petasites alpina.*
Honckenya peploides = **Arenaria peploides.**
Hondbessen = **Pæderia.**
Hookera coronaria = **Brodiæa grandiflora.**
Hopkirkia (of Sprengel) = **Salmea.**
Hoplophytum is included under **Æchmea.**
Hornemannia (of Bentham) is included under **Sibthorpia.**
Hornemannia (of Willdenow) = **Mazus.**
Hornemannia martinicensis is the correct name of *Vaccinium Imrayi.*
Horta = **Clavija.**
Hortensia opuloides = **Hydrangea hortensis.**
Hoteia = **Astilbe.**
Hovea includes *Plagiolobium* and *Platychilum.*
Hoya includes *Plocostemma.*
H. campanulata = **Physostelma Wallichii.**
H. coriacea = *Cyrtoceras multiflorum.*
Huegelia (of Reichenbach) = **Trachymene.**
Hultheimia berberifolia = **Rosa simplicifolia.**
Humboldtia (of Necker) = **Voyria.**
Humboldtia (of Ruiz and Pavon) = **Pleurothallis.**
Humulus = *Lupulus.*
Huntleya.
H. albido-fulva = **Zygopetalum Meleagris albido-fulvum.**
H. sessiliflora = **Zygopetalum violaceum.**
Huonia = **Acronychia.**
Hura (of Kœnig) = **Globba.**
Hutchinia = **Boucerosia.**
Hyacinthus nonscriptus = **Scilla nutans.**
Hyænachne globosa = **Toxicodendron capense.**
Hybanthera is included under **Tylophora.**
Hydrocera triflora = **Tytonia natans.**
Hydrocleis is the correct name of *Vespuccia.*
H. Commersoni is the correct name of *Vespuccia Humboldtii.*
Hydroglossum.
H. heterodoxum = **Lygodium heterodoxum.**
H. reticulatum = **Lygodium reticulatum.**
Hydropyrum = **Zizania.**
Hylogyne = **Telopea.**
Hymenetron = **Strumaria.**
Hymenocystis is included under **Woodsia.**
Hymenolæna = **Pleurospermum.**
Hymenophyllum (= *Sphærocionium*) includes *Leptocionium* and *Pachyloma.*
Hymenoxys (of Torrey and Gray) = *Ptilomeris*, the correct name of which is **Actinolepis**
H. californica = *Ptilomeris coronaria.*
Hyospathe.
H. elata = **Pigafetta elata.**
H. pubigera = **Prestoëa pubigera.**
Hypælyptum (in part) = **Hypolytrum.**
Hypelytrum = **Hypolytrum.**
Hyperogyne = **Paradisia.**
Hyphæne = *Cucifera* and *Douma.*
Hypolytrum = *Albikia, Beera, Hypælyptum* (in part), *Hypelytrum*, and *Tunga.*
Ianthe is included under **Celsia.**
Ibidium = **Spiranthes.**
Icica = **Bursera.**
Ictodes = **Symplocarpus.**
Ilex canadensis = **Nemopanthes canadense.**
Imhofia is included under **Hessea.**
Involucraria is included under **Trichomanes** (not *Trichosanthes*).
Iochroma fuchsioides = *Lycium fuchsioides.*
Ionidium includes *Pombalia.*
Ipomœa includes *Skinneria.*
Iresine (= *Xeraudra*) includes *Rosea.*
Iridorchis = **Cymbidium.**
Iris includes *Neubeckia.*
I. martinicensis = **Trimezia martinicensis.**
Ischarum is now included, by Bentham and Hooker, under **Biarum.**
Ischnia = **Tamonea.**
Ischyrolepis = **Restio.**
Isolepis gracilis = **Scirpus riparius.**
Isoloma should include *Sciadocalyx* and *Tydæa amabilis.*
Isoloma (of J. Smith) is included under **Lindsaya.**
Isolophus is included under **Polygala.**
Ivesia unguiculata = **Potentilla unguiculata.**
Ivira is included under **Sterculia.**
Ixia.
I. aristata = **Sparaxis grandiflora.**
I. bulbifera = **Sparaxis bulbifera.**
I. crispa = **Tritonia undulata.**
I. crocata = **Tritonia crocata.**
I. c. nigro-maculata = **Tritonia deusta.**
I. grandiflora = **Sparaxis grandiflora.**
I. polystachya = **Tritonia scillaris.**
I. punctata = **Watsonia punctata.**
I. tricolor = **Sparaxis tricolor.**
Jacobæa is included under **Senecio.**
Jacuanga = **Costus.**
Jalapa = **Mirabilis.**
Jambolifera = **Acronychia.**
Jambosa.
J. australis = **Eugenia myrtifolia.**
J. vulgaris = **Eugenia Jambos.**
Jankæa Heldreichii = **Ramondia serbica.**
Jasione = *Ovilla.*
Jezabel = **Freycinetia.**
Jocaste = **Smilacina.**
Johnia is included under **Salacia.**
J. coromandeliana = **Salacia prinoides.**
Joliffia = **Telfairia.**
Josepha = **Bougainvillæa.**
Josephia = **Dryandra.**
Juliana = **Choisya.**
Juncagineæ is included under **Naiadaceæ.**
Juncus includes *Tenageia.*
Justicia includes *Rostellaria.*
J. lilacina = **Thyrsacanthus callistachyus.**
J. longiracemosa (of gardens) = **Thyrsacanthus strictus.**
J. nitida = **Thyrsacanthus nitidus.**
J. pulcherrima = **Aphelandra cristata.**

Synonyms and Cross-references—*continued.*

Kæmpfera = **Tamonea.**
Kalosanthes versicolor = **Rochea versicolor.**
Kellettia = **Prockia.**
Kennedya includes *Physolobium.*
Kentia.
K. elegans = **Veitchia Storckii.**
K. Joannis = **Veitchia Johannis.**
K. Storckii = **Veitchia Storckii.**
Kentranthus = **Centranthus.**
Keteleeria Fortunei = **Abies Fortunei.**
Kieseria = **Bonnetia.**
Kinkina = **Cinchona.**
Knautia is included under **Scabiosa.**
Kolpakowskia = **Ixiolirion.**
K. ixiolirioides = **Ixiolirion Kolpakowskianum.**
Kordelestris = **Jacaranda.**
Korthalsia = *Ceratolobus.*
Kosaria = **Dorstenia.**
Kuhlia (of Blume) = **Fagræa.**
Kunzea includes *Salisia.*
Kunzia = **Purshia.**
Kurria = **Hymenodictyon.**
Kyrtanthus = **Posoqueria.**
Lacæna = *Navenia.*
Lachenalia.
L. lanceæfolia = **Scilla lanceæfolia.**
L. reflexa = **Scilla lanceolata.**
Lactaria = **Ochrosia.**
Lagascea = *Nocca.*
Lahaya = **Polycarpæa.**
Lamarckia = *Pterium.*
Lamprococcus Jacksoni = **Pitcairnia Jacksoni.**
Landolphia = *Willughbeia* (of Klotzsch).
Languas = **Alpinia.**
Larbrea is included under **Stellaria.**
Larix Kæmpferi = **Pseudolarix Kæmpferi.**
Lasiagrostis is included under **Stipa.**
L. Calamagrostis = **Stipa Lasiagrostis.**
Lasiandra.
L. argentea = **Pleroma holosericeum.**
L. Fontanesiana = **Pleroma granulosum.**
L. petiolata = **Pleroma Gaudichaudianum.**
Lasiolepis = **Eriocaulon.**
Lasiopetalum.
L. Baueri (of gardens) = **Guichenotia ledifolia.**
L. purpureum = **Thomasia purpurea.**
L. quercifolium = **Thomasia quercifolia.**
L. solanaceum = **Thomasia solanacea.**
Lasiopus (of Don) is included under **Taraxacum.**
L. sonchoides = **Taraxacum montanum.**
Lasiostoma (of Schreber) = **Strychnos.**
Lastrea.
L. eburnea = **Asplenium oxyphyllum.**
L. Standishii = **Aspidium lasercpitiifolium.**
L. varia = **Aspidium varium.**
Latania = *Cleophora.*
Laurembergia = **Serpicula.**
Laureria = **Juanulloa.**
Laurus.
L. Diospyrus = **Lindera melissæfolia.**
L. melissæfolia = **Lindera melissæfolia.**
Lavandula includes *Stœchas.*
Laxmannia (of Fischer) = **Coluria.**
Laxmannia (of Forster) = **Petrobium.**
Leæba = **Cocculus.**
Lechlera = **Solenomelus.**
Lecontia = **Peltandra.**
Ledebouria hyacintha = **Scilla indica.**
Ledgeria = **Galeola.**
Leea = *Ottilis.*
Legouzia = **Specularia.**
Leichardtia (of Brown) = **Marsdenia.**
Leiocarya = **Trichodesma.**
Leiochilus = *Cryptosanus.*
Leiphaimos = **Voyria.**
Lejica = **Zinnia.**
Lenidia = **Wormia.**
Leontice Chrysogonum = **Bongardia Rauwolfii.**
Leontodon (of Adanson) = **Taraxacum.**
Leopardanthus = *Wailesia* (correct name of which is **Dipodium**).
Lepachys is included under **Rudbeckia.**
Lepargyræa = **Elæagnus.**
Lepicephalus = **Cephalaria.**
Lepidanche = **Cuscuta.**
Lepidopelma = **Sarcococca.**
Lepidothamnus = **Dacrydium.**
Lepidozamia is included under **Macrozamia.**
Leptanthus = **Heteranthera.**
Leptargyreia = **Shepherdia.**
Leptocarpus = **Tamonea.**
Leptoglottis is included under **Schranckia.**
Leptogyne = **Pluchea.**
Leptosiphon roseus = **Gilia micrantha.**
Leptospermum includes *Pericalymma.*
Leptostachya (of Mitchell) = **Phryma.**
Leptostigma = **Nertera.**
Leucadendron = *Conocarpus* (of Adanson) and *Protea* (of Linnæus).
Leucadendron (of Linnæus) = **Protea.**
Leucocephala = **Eriocaulon.**
Leucohyle = **Trichopilia.**
Leucorhaphis = **Brillantaisia.**
Leucothoë floribunda = **Pieris floribunda.**
Lexarsa = **Myrodia.**
Liatris = *Psilosanthus.*
Libanotis is included under **Seseli.**
Libertia (of Dumortier) = **Funkia.**
Ligeria is included under **Sinningia.**
Lightfootia (of Schreber) = **Rondeletia.**
Ligustrina is included under **Syringa.**
L. amurensis = **Syringa japonica.**
Liliago is included under **Antericum.**
Liliastrum = **Paradisia.**
Lilium includes *Martagon* and *Notholirion.*
Limatodes rosea = **Calanthe rosea.**
Limia = **Vitex.**
Limnanthemum indicum = *Villarsia Humboldtiana* (of gardens).
Limnetis = **Spartina.**
Limnobium bogotense is the correct name of *Trianea bogotensis.*
Limnocharis Humboldtii = *Vespuccia Humboldtii* (correct name of which is **Hydrocleis Commersoni**).
Limnonesis = **Pistia.**
Limodorum Tankervilliæ = **Phaius grandifolius.**
Limonia Laureola = **Skimmia Laureola.**
Linagrostis = **Eriophorum.**
Linkia (of Cavanilles) = **Persoonia.**
Linospadix = **Bacularia.**
Linosyris Howardii = **Bigelovia Howardii.**
Lipochæta (in part) = **Zexmenia.**
Liquiritia is included under **Glycyrrhiza.**
Liriope (of Herbert) = **Elisena.**
Liriope (of Salisbury) = **Reineckea.**
Liriopsis = **Elisena.**
Lisianthus.
L. longifolius = **Leianthus longifolius.**
L. nigrescens = **Leianthus nigrescens.**
L. princeps = *Wallisia princeps.*
Lita = **Voyria.**
Lithagrostis = **Coix.**
Litobrochia is included under **Pteris.**
L. Vespertilionis = **Pteris incisa.**
Litsea includes *Tomex.*
Loasa palmata = **Blumenbachia insignis.**
Lobelia includes *Parastranthus.*
L. littoralis = **Pratia angulata.**
L. Pratiana = **Pratia repens.**
L. repens = **Pratia repens.**
Lobelia (of Presl) = **Siphocampylos.**
Lomandra = **Xerotes.**
Lomaria includes *Plagiogyria* and *Stenochlæna.*
Lomatogonium = **Pleurogyne.**
Lontanus = **Borassus.**
Lophia = **Alloplectus.**
Lophoclinium = **Podotheca.**
Lorentea (of Lagasca) is included under **Pectis.**
Lorentea (of Ortega) = **Sanvitalia.**
Loxanthus = **Phlogacanthus.**
Loxotis = **Rhynchoglossum.**
Ludolfia = **Arundinaria.**
Luma is included under **Myrtus.**
Lunanea = **Cola.**
Lupinaster is included under **Trifolium.**
Lupulus = **Humulus.**
Lychnis includes *Silenopsis.*
Lycimnia = **Melodinus.**
Lycopodium cordifolium = **Selaginella cuspidata elongata.**

Synonyms and Cross-references—*continued.*

Lygistum (of P. Browne) = **Manettia.**
Lygodium includes *Ugena.*
Lyncea = **Melasma.**
Lysanthe.
L. cana = **Grevillea arenaria.**
L. speciosa = **Grevillea punicea.**
Lysistigma = **Taccarum.**
Macdonaldia is included under **Thelymitra.**
Mackaya is now included, by Bentham and Hooker, under **Asystasia.**
Macleaya = **Bocconia.**
Macradenia mutica = **Trichopilia mutica.**
Macræa (of Lindley) = **Viviania.**
Macranoplon (in part) = **Phelipæa.**
Macroceratides = **Mucuna.**
Macrochlamys is included under **Alloplectus.**
Macrochloa tenacissima = **Stipa tenacissima.**
Macrocladus = **Orania.**
Macrogyne = **Aspidistra.**
Macrolinum = **Reinwardtia.**
Macronax = **Arundinaria.**
Macrorhynchus is included under **Troximon.**
Macrostigma (of Kunth) is included under **Tupistra.**
M. tupistroides = **Tupistra macrostigma.**
Macrozamia Fraseri = *Zamia Fraseri* (of gardens) and *Z. Miquelii* (of gardens).
Mærlensia = **Corchorus.**
Magnolia pumila is the correct name of *Talauma pumila.*
Maia = **Maianthemum.**
Mainea = **Trigonia.**
Majorana hortensis = **Origanum Majorana.**
Malachium is included under **Stellaria.**
Melachodendron ovatum = **Stuartia pentagyna.**
Malaspinæa = **Ægiceras.**
Manabea = **Ægiphila.**
Manitia = **Globba.**
Manlilia = **Polyxena.**
Mapa = **Petiveria.**
Maranta (in part) = **Stromanthe.**
Maranthes = **Parinarium.**
Marattia includes *Stibasia.*
Marialva = **Tovomita.**
Marica.
M. californica = **Sisyrinchium californicum.**
M. striata = **Sisyrinchium striatum.**
Marica (of Schreber) = **Cipura.**
Marquisia = **Coprosma.**
Marrubiastrum = **Sideritis.**
Martagon is included under **Lilium.**
Martensia = **Alpinia.**
Marumia (of Reinwardt) = **Saurauja.**
Masdevallia fenestrata. Correct name is **Pleurothallis atropurpurea.**
Massangea Lindeni. Correct name is **Schlumbergeria Lindeni.**
Massonia ensifolia is the correct name of *Polyxena pygmæa.*
Massovia is included under **Spathiphyllum.**
Mathea = **Schwenkia.**
Matthisonia = **Schwenkia.**
Mattuschkia = **Saururus.**
Maurocenia = **Cassine.**
Maxillaria. *Xylobium* was formerly included here.
M. citrina = **Zygopetalum citrinum.**
M. Rollissoni = **Zygopetalum Rollissoni.**
M. Steelii = **Scuticaria Steelii.**
M. Warreana = **Warrea tricolor.**
M. xanthina = **Zygopetalum xanthinum.**
Maximiliana = **Cochlospermum.**
Mays = **Zea.**
Mazeutoxeron = **Correa.**
Medica = **Tourretia.**
Megalotheca = **Restio.**
Megasea is included under *Saxifraga.*
Melaleuca.
M. neriifolia = **Tristania neriifolia.**
M. salicifolia = **Tristania neriifolia.**
Melanocarpum Sprucei = **Pleuropetalum costaricense.**
Melanoselinum is included under **Thapsia.**
Melanthium.
M. massoniæfolium = **Whiteheadia bifolia.**
M. monopetalum = **Wurmbea campanulata.**
Melarhiza = **Wyethia.**
Melastoma (in part) is included under **Pleroma.**
Melhania erythroxylon. Correct name is **Trochetia erythroxylon.**
Melinum = **Zizania.**
Melloca = **Ullucus.**
Melothria.
M. heterophylla is the correct name of *Zehneria hastata.*
M. punctata is the correct name of *Zehneria suavis.*
Melvilla is included under **Cuphea.**
Meniocus is included under **Alyssum.**
Mentha punctata = **Preslia cervina.**
Menyanthes.
M. exaltata = **Villarsia reniformis.**
M. ovata = **Villarsia ovata.**
Merendera.
M. caucasica = *Bulbocodium Eichleri* and *B. trigynum.*
M. persica = *Bulbocodium Aitchisoni.*
Meriana = **Watsonia.**
Messerschmidia is included under **Tournefortia.**
Methyscophyllum = **Catha.**
Metrosideros (in part) is included under **Callistemon.**
Metroxylon.
M. elatum (of gardens) = **Heterospathe elata.**
M. elatum (of Martius) = **Pigafetta elata.**
Metroxylon (of Sprengel) = **Raphia.**
Meynia = **Vangueria.**
Mezereum is included under **Daphne.**
Michauxia (of Necker) = **Relhania.**
Micranthera = **Tovomita.**
M. clusiæfolia = **Tovomita Choisyana.**
Microchilus = **Physurus.**
Microcycas calocoma is the correct name of *Zamia calocoma.*
Microgenetes = **Phacelia.**
Micropera is included under **Sarcochilus.**
Micropetalon is included under **Stellaria.**
Micropiper is included under **Peperomia.**
Miegia = **Arundinaria.**
Mieria = **Schkuhria.**
Mikania senecioides = **Senecio mikanioides.**
Milla.
M. Leichtlinii = **Triteleia Leichtlinii.**
M. macrostemon = **Nothoscordum macrostemon.**
M. porrifolia = **Triteleia porrifolia.**
M. uniflora = **Triteleia uniflora.**
Mimulus perfoliatus = **Leucocarpus alatus.**
Minuartia is included under **Arenaria.**
Miquelia (of Blume) = **Stauranthera.**
Miscopetalum is included under **Saxifraga.**
Mitopetalum = **Tainia.**
Mitrastigma = **Plectronia.**
Mollia (of Willdenow) = **Polycarpæa.**
Monella = **Cyrtanthus.**
Monobothrium = **Swertia.**
Monochilus (of Wallich) is included under **Zeuxina.**
Monogramme includes *Vaginularia.*
Monogynella = **Cuscuta.**
Monopsis conspicua = **Lobelia Speculum.**
Monoxora = **Rhodamnia.**
Moræa flexuosa = **Hexaglottis longifolia.**
Morenia oblongata conferta = **Chamædorea Sartorii.**
Morgagnia = **Simethis.**
Morna nitida = **Waitzia aurea.**
Mouffetta = **Patrinia.**
Muscaria is included under **Saxifraga.**
Mussinia = **Gazania.**
Myconia = **Ramondia.**
Mylinum = **Selinum.**
Myrioblastus = **Cryptocoryne.**
Myristica includes *Virola.*
Myrobalanus is included under **Terminalia.**
Myrobroma = **Vanilla.**
Myrsine Urvillei is the correct name of *Suttonia australis.*
Myrstiphyllum = **Psychotria.**
Myrtus Pimenta = **Pimenta officinalis.**
Nageia is included under **Podocarpus.**
N. japonica = **Podocarpus Nageia.**
Narcissus includes *Philogyne, Queltia, Schizanthes,* and *Tros.*
Nauchea = **Clitoria.**
Negretia = **Mucuna.**
Nematanthus (of Nees) = **Willdenowia.**
Nematoceras = **Corysanthes.**

Synonyms and Cross-references—*continued.*

Neottia.
N. acaulis = **Spiranthes picta variegata.**
N. australis = **Spiranthes australis.**
N. cernua = **Spiranthes cernua.**
N. grandiflora = **Spiranthes picta grandiflora.**
N. orchioides = **Spiranthes orchioides.**
N. speciosa = **Spiranthes colorans.**
Nephelium includes *Scytalia.*
Nephrodium includes *Pachyderis, Phlebigonium, Podopeltis, Proferea,* and *Pycnopteris.*
N. javanicum = **Didymochlæna polycarpa.**
N. villosum = *Polypodium spectabile.*
Nerium coccineum = **Wrightia coccinea.**
Neuroloma is included under **Parrya.**
Neustanthus = **Pueraria.**
Niebuhria oblongifolia = **Mærua oblongifolia.**
Nierembergia.
N. intermedia = **Petunia intermedia.**
N. phœnicea = **Petunia violacea.**
Nima = **Brucea.**
Niphobolus.
N. costatus = **Polypodium stigmosum.**
N. latus = **Polypodium Lingua Heteractis.**
Noltia = **Willemetia.**
Nordmannia = **Trachystemon.**
Nortenia = **Torenia.**
Nyctago = **Mirabilis.**
Nycterisition = **Chrysophyllum.**
Odontarrhena is included under **Alyssum.**
Odontocarpa = **Valerianella.**
Odontonema = **Thyrsacanthus.**
Œnoplea = **Berchemia.**
Œnothera includes *Pachylophus.*
Olea apetala = **Notelæa longifolia.**
Oncidium candidum = **Palumbina candida.**
Oncorrhynchus = *Triphysaria.* Correct name is **Orthocarpus.**
Onychium (of Blume) = **Dendrobium.**
Opercularia umbellata = **Pomax umbellata.**
Ophioglossum includes *Rhizoglossum.*
O. japonicum = **Lygodium japonicum.**
Ophioscorodon is included under **Allium.**
Oplismenus Burmanni variegatus is the correct name of *Panicum variegatum.*
Orchidocarpum = **Asimina.**
Orchis bicornis = **Satyrium cucullatum.**
Oreodaphne (of Nuttall) = **Umbellularia.**
Oreophila = **Pachystima.**
Orithalia = **Agalmyla.**
Ornitharium striatulum = **Sarcochilus teres.**
Ornithogalum.
O. divaricatum = **Chlorogalum pomeridianum.**
O. Squilla = **Urginea maritima.**
Ornus europea = **Fraxinus Ornus.**
Orobus lathyroides = **Vicia oroboides.**
Orthocarpus erianthus roseus is the correct name of *Triphysaria versicolor.*
Osmanthus Aquifolium = *Olea ilicifolia.*
Otoptera Burchellii = **Vigna Burchellii.**
Ouvirandra is now included, by Bentham and Hooker, under **Aponogeton.**
Oxalis sensitiva = **Biophytum sensitivum.**
Oxyura chrysanthemoides = **Layia Calliglossa.**
Pachyneurum is included under **Parrya.**
Pachyphytum.
P. bracteosum = **Cotyledon Pachyphytum.**
P. roseum = **Cotyledon adunca.**
Paliurus aculeatus = *Zizyphus Paliurus.*
Panax.
P. horridum = **Fatsia horrida.**
P. spinosa = **Aralia pentaphylla.**
Panicum includes *Digitaria* and *Tricholæna.*
Parthenium = *Villanova* (of Ortega).
Passerina.
P. hirsuta = **Thymelæa hirsuta.**
P. Tartonraira = **Thymelæa Tartonraira.**
Passiflora.
P. manicata = **Tacsonia manicata.**
P. pinnatistipula = **Tacsonia pinnatistipula.**
P. vitifolia = **Tacsonia Buchanani.**
Patrinia sibirica = *Valeriana sibirica.*
Penæa.
P. imbricata = **Sarcocolla imbricata.**
P. Sarcocolla = **Sarcocolla squamosa.**
Pentaceros is included under **Buettneria.**
Pentaphragma = *Physianthus.* Correct name is **Araujia.**
Pentaphyllon is included under **Trifolium.**
Pentlandia latifolia = **Urceolina miniata.**
Pepinia is included under **Pitcairnia.**
Peranema cyatheoides = **Sphæropteris barbata.**
Pereira medica = **Coscinium fenestratum.**
Petalotoma = **Carallia.**
Petrocoptis pyrenaica = **Lychnis Lagascæ.**
Petrophyes = **Monanthes.**
Pfeifferia = **Cuscuta.**
Phacelia Whitlavia = *Whitlavia grandiflora.*
Phalacromesus = **Tessaria.**
Phalænopsis includes *Stauroglottis.*
Phalangium.
P. argenteo-lineare = **Anthericum variegatum.**
P. pomeridianum = **Chlorogalum pomeridianum.**
Phalocallis is included under **Cypella.**
Phegopteris villosa = **Nephrodium pubescens.**
Phenakospermum = **Ravenala.**
Phlebodium inæquale = **Polypodium guatemalense.**
Phlomis Leonurus = **Leonotis Leonurus.**
Phrynium sanguineum. Correct name is **Stromanthe sanguinea.**
Phyllanthus includes *Reidia* and *Scepasma.*
Phymatodes vulgaris = **Polypodium Phymatodes.**
Piaranthus.
P. geminatus = **Podanthes geminata.**
P. piliferus = **Trichocaulon piliferum.**
Picea eremita = **Abies excelsa eremita.**
Pilogyne = **Zehneria.**
Pimpinella includes *Sisarum* and *Tragium.*
Pincenictitia tuberculata = **Beaucarnea recurvata.**
Pinellia tuberifera = *Arum ternatum.*
Pinus.
P. microcarpa = **Larix americana.**
P. Nuttallii – **Larix occidentalis.**
Piper includes *Pothomorphe.*
Piptanthus nepalensis = *Thermopsis nepalensis.*
Piratinera = **Brosimum.**
Pitrophyllum ionantha = **Tillandsia ionantha.**
Pittosporum includes *Senacia.*
Planera (of Giseke) = **Costus.**
Platycapnos is included under **Fumaria.**
Platystachya is included under **Tillandsia.**
Platytheca galioides = *Tremandra verticillata.*
Plectrurus = **Tipularia.**
Pleionema Gaudichaudiana = **Pleroma Gaudichaudianum.**
Pleroma includes *Tibouchina.*
Pleuridium oxylobium = **Polypodium trifidum.**
Pleurothallis includes *Rhyncopera.*
P. coccinea = **Rodriguezia secunda.**
Podachænium paniculatum is the correct name of *Ferdinanda eminens* (mentioned under *Zaluzania*).
Podalyria capensis = **Virgilia capensis.**
Podocarpus.
P. asplenifolius = **Phyllocladus asplenifolius.**
P. chinensis = *Taxus Makoya.*
Pœppigia (of Bertero) = **Rhaphithamnus.**
Pogochilus = **Galeola.**
Pogospermum = **Catopsis.**
Polygonum adpressum = **Muehlenbeckia adpressa.**
Polypappus (of Nuttall) = **Tessaria.**
Polypodium includes *Schellolepis, Stegnogramme, Thylacopteris,* and *Xiphopteris.*
Ponceletia (of Thouars) = **Spartina.**
P. sprengelioides = **Sprengelia Ponceletia.**

Synonyms and Cross-references—*continued.*

Porphyrocoma lanceolata = **Dianthera Pohliana.**
Porphyrostachys = **Stenoptera.**
Pourretia.
P. nivosa (of gardens) = **Tillandsia tectorum.**
P. surinamensis (of gardens) = **Tillandsia pulchra.**
Prinos.
P. dubius = **Ilex mollis.**
P. integrifolius = **Nemopanthes canadense.**
Prismatocarpus (in part) = **Specularia.**
Pritchardia filamentosa = **Washingtonia filifera.**
Protea (of Linnæus) = **Leucadendron.**
P. abrotanifolia = **Serruria phylicoides.**
P. a. hirta = **Serruria abrotanifolia.**
P. a. minor = **Serruria emarginata.**
P. a. odorata = **Serruria odorata.**
P. argentiflora = **Serruria triternata.**
P. glomerata = **Serruria pedunculata.**
P. imbricata = **Sorocephalus imbricatus.**
P. triternata = **Serruria millefolia.**
Prumnopitys elegans = **Podocarpus andina.**
Psychechilus = **Zeuxina.**
Ptilostephium is included under **Tridax.**
Ptychochilus = **Tropidia.**
Pulmonaria.
P. maritima = **Mertensia maritima.**
P. sibirica = **Mertensia sibirica.**
Pulsatilla is included under **Anemone.**
P. vulgaris = **Anemone Pulsatilla.**
Pyrolirion aureum = **Zephyranthes flava.**
Pyrrheima Loddigesii (of gardens) = **Tradescantia fuscata.**
Pythonium = **Thomsonia.**
Rafnia includes *Vascoa.*
Ramtilla = *Veslingia* (correct name of which is **Guizotia**).
Raphidophyllum = **Sopubia.**
Raxopitys = **Cunninghamia.**
Regelia.
R. magnifica (of gardens) = **Verschaffeltia splendida.**
R. majestica (of gardens) = **Verschaffeltia splendida.**
R. princeps (of gardens) = **Verschaffeltia splendida.**
Reidia glaucescens = **Phyllanthus pallidifolius.**
Retinospora.
R. juniperoides = **Chamæcyparis ericoides.**
R. obtusa pygmæa = **Chamæcyparis obtusa nana.**
Rhexia.
R. petiolaris = **Pleroma Gaudichaudianum.**
R. petiolata = **Pleroma Gaudichaudianum.**
Rhodiola rosea = **Sedum Rhodiola.**
Rhododendron includes *Vireya.*
Rhodospatha picta is the correct name of *Spathiphyllum pictum.*
Rhynchosia.
R. albo-nitens = **Desmodium Skinneri albo-nitens.**
Rhynchospermum angustifolium = **Trachelospermum jasminoides angustifolium.**
Robinia squamata = **Pictetia squamata.**
Rochea.
R. falcata is the correct name of *Crassula falcata.*
R. perfoliata is the correct name of *Crassula perfoliata.*
Roëlla decurrens = **Wahlenbergia capensis.**
Rœpera.
R. aurantiaca = **Zygophyllum fruticulosum bilobum.**
R. fabagifolia = **Zygophyllum fruticulosum.**
Rosanovia ornata = **Sinningia conspicua.**
Roscoëa (of Roxburgh) = **Sphenodesma.**
Rostraria is included under **Trisetum.**
Rottlera (of Willdenow) = **Trewia.**
Rouhamon = **Strychnos.**
Roxburghia gloriosa = **Stemona gloriosoides.**
Ruckia Ellemeeti = **Rhodostachys bicolor.**
Ruellia includes *Stemonacanthus.*
Sagina pilifera = *Spergula pilifera.*
Salacia includes *Tonsella* and *Tontelea.*
Salpingantha coccinea = **Thyrsacanthus strictus.**
Sanseviera javanica = **Dracæna elliptica.**
Sapindus Danura = **Nephelium verticillatum.**
Sarcostemma (of Decaisne) = **Philibertia.**
Sauroglossum elatum = **Spiranthes Sauroglossum.**
Saxegothea = *Squamataxus.*
Scalia jaceoides = **Podolepis acuminata.**
Schubertia (of Blume) = **Horsfieldia.**
Scilla serotina = **Dipcadi serotina.**
Scyphæa = **Marila.**
Seaforthia latisecta = **Pinanga latisecta.**
Sempervivum spinosum = **Cotyledon spinosa.**
Senecillis is included under **Senecio.**
Sideroxylon spinosum = **Argania Sideroxylon.**
Sipholanthus indica = **Clerodendron Siphonanthus.**
Sisyrinchium.
S. longistylum = **Solenomelus chilensis.**
S. odoratissimum = **Symphyostemon narcissoides.**
S. pedunculatum = **Solenomelus chilensis.**
Solenachne = **Spartina.**
Sophora = *Ammodendron.*
Southwellia is included under **Sterculia.**
Spadostyles Sieberi = **Pultenæa euchila.**
Spartothamnus (of Webb) is included under **Cytisus.**
Spathiphyllum Wallisii (of Masters) = **Stenospermation pompayanense.**
Spennera = **Aciotis.**
Spergulastrum is included under **Stellaria.**
Spermadictyon azureum = **Hamiltonia scabra.**
Sphærotele (of Link) is included under **Urceolina.**
Spiranthera Fraseri = **Pronaya elegans.**
Splitgerbera = **Bœhmeria.**
Stachytarpheta mutabilis = *Verbena mutabilis.*
Stalagmites (in part) = **Xanthochymus.**
Stapelia pilifera = **Trichocaulon piliferum.**
Statice (in part) = **Armeria.**
S. Ararati = **Acantholimon glumaceum.**
S. monopetala = **Limoniastrum monopetala.**
Stauracanthus is included under **Ulex.**
S. aphyllus = **Ulex genistoides.**
Stenochlæna heteromorpha = **Lomaria filiformis.**
Stissera = **Curcuma.**
Stromanthe sanguinea = *Thalia sanguinea.*
Stylandra pumila = **Podostigma pubescens.**
Stylocoryne (of Wight and Arnott) = **Webera.**
Swietenia Chloroxylon = **Chloroxylon Swietenia.**
Symea gillesioides = **Solaria miersioides.**
Symmetria = **Carallia.**
Symphoricarpus puniceus = **Lonicera punicea.**
Syneilesis is included under **Senecio.**
Talbotia elegans = **Vellozia elegans.**
Tapeinophallus is included under **Amorphophallus.**
Tarenna = **Webera.**
Telanthera = *Teleianthera.*
Ternatea vulgaris = **Clitoria ternatea.**
Tetragonolobus purpurea = **Lotus Tetragonolobus.**
Thalia spectabilis = **Stromanthe spectabilis.**
Thamnopteris australasicum = **Asplenium Nidus australasicum.**
Thlaspi arabicum = **Æthionema Buxbaumii.**
Thuya.
T. chilensis = **Libocedrus chilensis.**
T. gigantea (of gardens) = **Libocedrus decurrens.**
Thymus Acinos = **Calamintha Acinos.**
Tillandsia musaica = **Massangea musaica.**
Tornelia fragrans = **Monstera deliciosa.**
Tradescantia tricolor = **Zebrina pendula.**

Synonyms and Cross-references—*continued.*

Tricratus admirabilis = **Abronia umbellata.**
Trisiola = **Uniola.**
Tupa Feuillei = **Lobelia Tupa.**
Turpinia punctata = **Poiretia scandens.**
Tussacia (of Klotzsch) = **Catopsis.**
Tussilago.
T. fragrans = **Petasites fragrans.**
T. hybrida Petasites vulgaris.
T. Petasites = **Petasites vulgaris.**
Urania speciosa = **Ravenala madagascariensis.**
Uranthera = **Acisanthera.**
Vaccinium braziliensis = **Gaylussacia pseudo-vaccinium.**
Verbesina.
V. aurea = **Zexmenia aurea.**
V. Coreopsis = **Actinomeris squarrosa.**
Vieusseuxia tripetaloides = **Moræa tripetala.**
Vitis.
V. dissecta = **Ampelopsis aconitifolia.**
V. japonica (of gardens) = **Ampelopsis tricuspidata.**
Vitmania = **Oxybaphus.**
Vriesia.
V. bellula = **Tillandsia heliconioides.**
V. brachystachys = **Tillandsia carinata.**
V. gigantea = **Tillandsia regina.**
V. Glaziovana = **Tillandsia regina.**
V. Morreniana = **Tillandsia psittacino-carinata.**
V. musaica = **Massangea musaica.**
V. psittacina brachystachys = **Tillandsia carinata.**
Vriesia—*continued.*
V. retroflexa = **Tillandsia psittacino-scalaris.**
Wallichia nana = **Didymosperma nanum.**
Warrea quadrata = **Zygopetalum marginatum.**
Watsonia Liliago = **Anthericum Liliago.**
Wintera aromatica = **Drimys Winteri.**
Xiphion.
X. latifolium = **Iris xiphioides.**
X. Sisyrinchium = **Moræa Sisyrinchium.**
X. tingitanum = **Iris filifolia.**
Xylosteum dumetorum = **Lonicera Xylosteum.**
Xyris altissima = **Bobartia spathacea.**

NEW INTRODUCTIONS, ETC.

THIS Appendix contains all the new plants of any horticultural interest which have been introduced to British gardens during the progress of the publication of the DICTIONARY OF GARDENING, as well as some older ones—worthy of being included—which have been omitted under their respective genera.

Mr. J. DOUGLAS has undertaken the parts relating to Florists' Flowers, &c., and his name is a guarantee that this section of the work will be thoroughly well done.

GEORGE NICHOLSON.

ABELIA. This genus embraces about half-a-dozen species, natives of the Western Himalayas, China, Japan, and Mexico. To those described on p. 1, Vol. I., the following should now be added:

A. rupestris grandiflora (large-flowered). *fl.* rosy-white, larger than those of the type. Whole plant more robust. A seedling of Italian origin.

A. spathulata (spathulate). *fl.* sessile, in pairs on a short, slender peduncle; corolla white, with yellow blotches on the throat, nearly 1in. long. April. *l.* about 2in. long, elliptic-lanceolate, obtusely acuminate, sinuate-toothed, glabrous above, pubescent beneath, edged purple. Japan, 1883. A free-flowering, much-branched, evergreen shrub. (B. M. 6601.)

ABIES. To the species described on pp. 1-2, Vol. I., the following should now be added:

A. Eichleri (Eichler's). This is closely allied to *A. Nordmanniana*, from which it may be distinguished by its cones, which in a young state are bluish-black instead of green, and at a corresponding stage are 2½in. long and 1in. broad, by the whiter or paler under surface of its mature leaves, and by the blue-green colour of its young shoots. Caucasus. (W. G. Z. 1882, No. 2.)

A. Nordmanniana (Nordmann's). *l.* on the sterile branchlets either two-ranked or arranged more or less round the branches, linear, flat, retuse at apex, green above and scarcely sulcate, below one-ribbed, with two white lines; those on the fruiting branches curved, ascending or erect. *cones* sessile, elliptic-oblong or cylindrical; bracts cuspidate, exserted, reflexed; scales reniform from a shortly cuneate base. Branches horizontally whorled, the lower ones deflexed. Asia Minor. A tall tree, of pyramidal habit. (B. M. 6992; R. G. 699.)

A. N. horizontalis (horizontal). A dwarf, compact-growing form, with horizontally spreading branches; it cannot be made to produce a leader, hence its peculiar habit. A chance seedling found in a nursery in the Vosges.

ABROMA. The two or three species embraced in this genus inhabit tropical Asia and Australia. To those described on p. 3, Vol. I., the following should now be added:

A. sinuosa (sinuate). *l.* broadly ovate, pedately pinnatifid, on slender petioles. Madagascar, 1884. A pleasing species, of slender habit.

ABUTILON. A genus of about seventy species, distributed over the warmer regions of the globe. To the species and varieties described on pp. 4-5, Vol. I., the following should now be added:

A. Thompsoni flore-pleno (double-flowered). A garden variety with double flowers. 1885. Greenhouse. (R. H. 1885, p. 324.)

Varieties. CHRYSOSTEPHANUM COMPACTUM, a pleasing shade of chrome-yellow; a good variety for bedding out. MADAME JOHN LAING, rose, very large flowers. M. H. CANNELL, a very free-flowering hybrid from *A. megapotamicum*.

ACACIA. Leaves bipinnate; leaflets often small and many-jugate, or reduced to a filiform petiole (phyllode). To the species described on pp. 5-7, Vol. I., the following should now be added:

A. leprosa (leprous). *fl.* numerous in a globular head, mostly five-parted; petals yellow, united to the middle. May. *l.*, phyllodia narrow, linear-lanceolate, acute, or obtuse with a small point, narrowed at base, 1½in. to 3in. long. Branchlets pendulous, more or less glutinous. Australia, 1817. A tall shrub or small tree. (B. R. 1441.)

A. lineata (lined). *fl.* ten to fifteen or more in a small, globular head, mostly five-parted; petals yellow, smooth. April. *l.*, phyllodia linear, with a small, hooked point, usually ½in. to ¾in. long. Branches pubescent or villous, sometimes slightly resinous. *h.* 6ft. Australia, 1824. (B. M. 3346.)

ACALYPHA. This genus comprises about 220 species, broadly dispersed over the warm regions, a few being extra-tropical American. Leaves alternate, often ovate, more or less toothed, three to five-nerved or penniveined. To the species described on p. 7, Vol. I., the following should now be added:

A. obovata (obovate). *l.* obovate, green with creamy edges when young, changing with age to olive-green with pink margins, and finally having a bronzy centre, and broad, rosy-crimson margins. Polynesia, 1884. An ornamental foliage plant.

ACANTHOMINTHA (from *acanthos*, a spine, in allusion to the spiny-toothed bracts, and *Mentha*, Mint, as the plant was formerly included under *Calamintha*). ORD. *Labiatæ*. A monotypic genus. The species is a small, glabrous, half-hardy annual, requiring ordinary cultivation.

A. ilicifolia (Holly-leaved). *fl.* three to eight in a whorl in all the upper axils; whorls subtended by opposite bracts, which are larger than the leaves and spiny-toothed; calyx tubular, bilabiate; corolla ½in. long, the upper lip white, small, the lower one purple, with a yellow throat, four-lobed. July. *l.* petiolate, ½in. to 1in. long, rounded or ovate, with a cuneate base, coarsely and bluntly toothed. Branches ascending, 6in. to 8in. long. California, 1883. (B. M. 6750.)

ACANTHOPANAX (from *acanthos*, a spine, and *Panax*; alluding to the spiny stems and Panax-like aspect of the plants). ORD. *Araliaceæ*. A genus embracing about eight species of stove or greenhouse, glabrous or tomentose shrubs (rarely trees?), natives of Japan, China, and tropical Asia. Flowers polygamous or hermaphrodite; petals five, rarely four, valvate; stamens five, rarely four, the filaments filiform; pedicels continuous with the flowers; bracts small or wanting; umbellets paniculate or almost solitary. Leaves palmately cleft, digitate, or one-foliolate. Only two species call for mention here.

A. ricinifolia (Ricinus-leaved). The correct name of the plant described on p. 104, Vol. I., as *Aralia Maximowiczii*.

A. spinosum (spiny). The correct name of the plant described on p. 104, Vol. I., as *Aralia pentaphylla*.

ACANTHUS. About fourteen species, inhabiting tropical and sub-tropical regions, are included in this genus. To those described on pp. 8-9, Vol. I., the following should now be added:

A. Caroli-Alexandri (Charles Alexander's). *fl.* white, often suffused rose-colour, in a dense spike. Summer. *l.* few, radical, in a lax rosette, lanceolate, pinnatifid, spiny-toothed, 16in. long, 3in. to 4in. broad. Stem 9in. to 18in. high, with two to four similar leaves. Greece, 1887. (R. G. 1886, pp. 626-635, f. 73-75.)

ACER. The species of this genus number about fifty, and are found in Europe, North America, North Asia, Java, and the Himalayas. To those described on pp. 9-11, Vol. I., the following should now be added:

A. colchicum tricolor (Colchican, three-coloured). A synonym of *A. pictum tricolor*.

A. Heldreichii (Heldreich's). *fl.* in small, terminal panicles, which are shorter than the leaves. *l.* small, palmately five-lobed; lobes obtusely dentate, acute, the middle one cuneately tapering to its base. Greece. (G. C. n. s., xv., p. 141; R. G. 1185.)

A. insigne (remarkable).* *fl.* green, ¼in. in diameter; panicles pyramidal, terminal, 3in. to 4in. long, appearing with the leaves. May. *l.* 5in. to 6in. in diameter, rounded-reniform, palmately divided to the middle into five to seven oblong, acute, coarsely and obtusely serrated lobes, glabrous above, more or less tomentose beneath. Persia. The latest of all the Maples to come into leaf. (B. M. 6697.) SYN. *A. velutinum*.

A. pictum tricolor (three-coloured). *l.*, young ones of a bright violaceous-red, irregularly shading off here and there into all tints of dark red or crimson to creamy-white. 1886. Garden variety. SYN. *A. colchicum tricolor*.

A. platanoides compactum (compact). An ornamental variety, producing a compact, round head. 1886.

A. p. integrilobum (entire-lobed). This only differs from the type in having the lobes of the leaf entire. (R. G. 1887, p. 431, f. 107-8.)

A. p. Reichenbachii (Reichenbach's). *l.* large, changing in the autumn to a deep crimson-red, varying to yellow and brown.

A. p. undulatum (wavy). *l.* bullate, with very wavy, crisped margins. A curious and interesting variety.

A. velutinum (velvety). A synonym of *A. insigne*.

ACHILLEA. Upwards of 100 species have been described by botanists (but, according to the authors of the "Genera Plantarum," the number may be considerably reduced): they inhabit Europe and Western Asia. Leaves alternate. To the species described on pp. 11-12, Vol. I., the following should now be added:

A. rupestris (rock-loving).* *fl.-heads* white, greenish towards the centre, pedicellate, ½in. to ¾in. broad; corymbs 1in. to 1½in. in diameter. May. *l.* on the shoots rosulate, ½in. to ½in. long, linear-spathulate, entire; cauline ones similar, scattered, spreading. Rootstock tufted. Southern Italy, 1886. (B. M. 6905.)

ACHIMENES. About a score species, all tropical American (from Brazil to Mexico), are included in this genus. To the species and varieties described on pp. 12-14, Vol. I., the following should now be added:

FIG. 1. FLOWERING BRANCH OF ACHIMENES TUBIFLORA.

A. tubiflora (tubular-flowered).* *fl.* pure white; corolla tube 4in. long, a little enlarged and curved upwards, with a broad gibbosity at base, the limb 1½in. broad, equally five-lobed; pedicels 2in. long; panicle several-flowered. Summer. *l.* opposite, oblong, acuminate, reticulated, downy, obscurely crenate; petioles short and thick. Buenos Ayres. See Fig. 1. SYNS. *Dolichoderia tubiflora, Gloxinia tubiflora* (B. M. 3971; B. R. 1845, 3).

ACINETA. This genus comprises about eight species, natives of tropical America (from Colombia to Mexico). To those described on p. 14, Vol. I., the following should now be added:

A. Hrubyana (Hruby's). *fl.* ivory-white, disposed in loose racemes; lip marked with a few purple spots, and having narrow, erect side lobes. New Grenada, 1882. A fine and distinct species.

A. Humboldtii fulva (fulvous). *fl.* tawny-yellow, dotted all over with purplish-brown; lip of a brighter yellow, spotted with dark purple. A handsome variety.

A. H. straminea (straw-coloured). *fl.* pale straw-yellow, with very few spots. New Grenada.

ACONITUM. According to Bentham and Hooker, the number of distinct species is only about eighteen, many of the plants described on pp. 15-17, Vol. I., being mere varieties. They are chiefly mountain plants, spread over

Aconitum—*continued.*

the greater part of Europe and Central Asia, very few species being found in North America. *A. dissectum* is the only addition calling for mention.

A. dissectum (dissected). This plant has much in common with *A. Napellus*, but it is more hairy; the principal difference is exhibited in the narrower helmet of the flowers. Himalayas, 1885. (R. G. 1886, p. 226, f. 16.)

ACROSTICHUM. The species number upwards of 180. To those described on pp. 18-20, Vol. I., the following should now be added:

A. Lechlerianum (Lechler's). *rhiz.* woody, wide-scandent, scaly. *sti.* 6in. to 12in. long, firm, erect, scaly downwards. *fronds* 3ft. to 4ft. long, 1in. to 1½in. broad, the barren one quadripinnatifid; lower pinnæ 6in. to 9in. long, 4in. to 5in. broad; pinnules close, lanceolate; segments oblong, deeply lobed; rachises pubescent; fertile pinnules narrower, distant, the segments oblong-cylindrical, with a space between them, the lower ones rather beaded. Peru and Ecuador, 1886. Stove. SYN. *Polybotrya Echleriana* (G. C. n. s., xxv., pp. 400-1).

A. magnum (large). *rhiz.* sub-erect, the basal paleæ small, nearly black. *sti.* tufted, those of the barren fronds 3in. to 4in. long. *barren fronds* 2ft. to 3ft. long, 1½in. to 2in. broad, narrowed gradually to both ends, the paleæ of the upper surface numerous, minute, whitish, those of the under side ferruginous. British Guiana, 1880. Stove. SYN. *Elaphoglossum magnum.*

ADENOCARPUS. This genus embraces eight species, natives of Mediterranean and South-western Europe, North and tropical Africa, and the Canary Islands. To those described on p. 23, Vol. I., the following should now be added:

A. decorticans (barkless).* *fl.* bright yellow, Pea-like, in short, compact racemes. *l.* densely set, two or three-foliolate; leaflets linear, soft, dark green. Spain, 1883. A beautiful, half-hardy, evergreen shrub, having the general aspect of Furze. (G. C. n. s., xxv., p. 725; R. H. 1883, p. 156.)

ADESMIA. About 110 species have been referred to this genus, but scarcely more than eighty are entitled to rank as such. To those described on p. 24, Vol. I., the following should now be added:

A. balsamica (balsamic). *fl.* golden-yellow, ⅜in. in diameter; racemes terminal, effuse, three to eight-flowered. March. *l.* 1in. to 1½in. long, shortly petiolate, pinnate; leaflets ten to thirteen pairs, ⅛in. to ¼in. long, sessile, dark green, oblong or cuneately obovate. Branches very slender, leafy. Chili, 1837. A nearly glabrous, excessively branched shrub, covered with balsamic glands. (B. M. 6921.)

ADIANTUM. Tropical America is the head-quarters of this genus, which embraces about eighty species. To the species and varieties described on pp. 24-9, Vol. I., the following should now be added:

A. assimile cristatum (crested). *fronds* elegantly crested. 1887. Garden variety.

A. Birkenheadii (Birkenhead's). *fronds* tripinnate, about 2½ft. long and 1ft. broad, deltoid, acuminate; pinnæ alternate, distant and long-stalked towards the base, closer together and sessile near the apex, the lower ones bipinnate, the upper ones pinnate; pinnules obtusely oblong-trapezoid, cut on the upper edge into shallow lobes. 1886. A fine garden Fern, of tufted habit.

A. Bournei (Bourne's). A variety of *A. cuneatum.*

A. Burnii (J. B. Burn's). *sti.* smooth, ebeneous. *fronds* evergreen, glabrous, broadly ovate, acuminate, tri- or quadripinnate; pinnæ ovate, the lower ones with a long stalk, the upper ones almost sessile; pinnules stipitate below, the basal one 2in. to 2½in. long, narrowly ovate, the basal pinnulets compound, the upper ones still narrower because less divided at the base. *sori* numerous, roundish-reniform, seated at the base of a notch at the apex of the lobes. Garden hybrid. Stove.

A. Capillus-Veneris digitatum (digitate). *fronds* not symmetrical, but with a tendency to become unequally ovate, dwarfish, smooth, evergreen; pinnæ and pinnules unequal and irregular, the more perfect pinnules rhomboid, with a rounded apex, deeply furcate-lobed, the edges marginate. *sori* wanting. A curious variety.

A. C.-V. grande (large). A very handsome variety, larger, denser, and more bushy in habit than the type. 1886. Hardy.

A. C.-V. imbricatum (imbricated). *sti.* and rachises glossy ebeneous. *fronds* ovate, 6in. long, densely imbricated, bi-tripinnate, evergreen; pinnæ crowded, 2in. to 2½in. long, 1½in. wide; pinnules large, much overlapping, the lateral ones rhomboid, ⅜in. long and ¼in. broad, the terminal ones broadly flabellate, 1in. or more in width. *sori* elongate-oblong.

A. C.-V. obliquum (oblique). *fronds*, pinnæ very large, oblique. 1885. (I. H. 1885, 546.)

Adiantum—*continued.*

A. Collisii (Collis'). *sti.* black, slender, 1ft. to 1½ft. long. *fronds* triangular, 1½ft. to 2ft. across; pinnules small, rhomboid, truncate on the inner and lower sides, and slightly toothed on the outer and upper margins. 1885. A beautiful, decorative, stove Maidenhair, of garden origin.

A. cuneatum Bournei (Bourne's). *sti.* long. *fronds* dense, triangular. 1882. A garden variety in the way of *A. Pacottii*, but less refined in growth.

A. c. deflexum (deflexed). *fronds* triangular, three or four times pinnate; pinnules deflexed, lobed; lobes crenate-toothed. 1884. A garden hybrid between *A. Bausei* and *A. cuneatum.* Stove.

A. c. elegans (elegant). *sti.* glossy, 6in. long. *fronds* triangular, about 9in. long and broad; pinnæ ovate-triangular, with rather distantly-set, cuneate pinnules, which are ¼in. long and ⅛in. broad. Gardens, 1885. Stove.

A. c. grandiceps (large-headed). A crested variety, of drooping habit, well adapted for basket culture.

A. c. strictum (upright). *fronds* erect, four times pinnate; pinnæ ascending, arranged somewhat spirally. 1884. Stove.

A. cyclosorum (circular-sorused). *sti.* stoutish, glossy black, 8in. to 10in. long. *fronds* 1½ft. to 2ft. long, triangular, tripinnate, glabrous; pinnæ spreading, ovate, stalked; pinnules five to nine lines long, rhomboid. *sori* eight to ten to a pinnule, circular, marginal. Ecuador, 1887. A handsome and well-marked, deciduous, stove species.

A. Daddsii (J. Dadds'). *sti.* glossy ebeneous, about 8in. long. *fronds* above 1ft. long, fertile throughout, deltoid, decompound, evergreen, glabrous; pinnæ triangular-ovate, stipitate, furnished with numerous but not crowded pinnules; ultimate segments very numerous, quite small, distinct, everywhere pedicellate, the terminal ones cuneate with two or three lobes at the apex, the intermediate ones rhomboid-cuneate, more or less deeply lobed on the anterior side, the basal ones roundish or obovate, narrowed into the pedicels. *sori* roundish-reniform, situated in a notch at the apex of the marginal lobes. A supposed hybrid. Greenhouse.

A. elegans (elegant). *sti.* blackish-purple. *fronds* triangular-ovate, quadripinnate; pinnæ distant, long-stalked, ovate or deltoid, with stalked pinnules; pinnulets very small, two or three-lobed, roundish, the larger ones slightly trapezoid, the terminal ones shortly cuneate. 1886. A graceful, greenhouse, evergreen Fern, of garden origin.

A. Fergusoni (Ferguson's).* *sti.* long, glossy purplish-black. *fronds* triangular-ovate, tripinnate, stiffly erect; pinnæ long-stalked, spreading; pinnules variable, mostly large, bluntly ovate, truncate at base, with a pair of large basal lobes, and three or four smaller lobes above, the pedicels continuous with the rachis, not articulated, all the lobes again lobulate, and, where sterile, finely toothed. *sori* oblong, at the tops of the ultimate lobes. Ceylon, 1884. Stove. (G. C. ser. iii., vol. ii., p. 469.)

A. festum (pleasant). *sti.* 8in. to 9in. long, purplish-ebeneous. *fronds* 1ft. long, glabrous, evergreen, decompound, drooping, triangular, acuminate; pinnæ deltoid, spreading; pinnules of ultimate segments small, crowded, cuneate or rhomboid-cuneate, larger towards their extremities, the terminal ones symmetrically or unequally cuneate, bipartite, with deeply lobed divisions, the rest lobed on their anterior edge. *sori* roundish-reniform, placed in a sinus of the lobe. Greenhouse hybrid.

A. fragrantissimum (very fragrant). *sti.* 5in. to 6in. long, glossy ebeneous. *fronds* 1ft. to 1½ft. long, deltoid, quadripinnate, glabrous, evergreen; pinnæ ovate, spreading, the basal ones long-stalked; ultimate pinnules or pinnulets large, on long, slender pedicels, cuneate, the terminal ones equally lobed at the apex, the lateral ones more or less obliquely cuneate, lobed. *sori* roundish-reniform, placed in a sinus at the apex of the lobes. Probably a hybrid. Stove. Reason for specific name not stated. (G. C., ser. iii., vol. ii., p. 199.)

A. hians (gaping). *sti.* black. *fronds* about 10in. long, triangular-ovate, tripinnate; pinnæ ovate, the upper ones stalked, the lower ones almost sessile; pinnules variable, roundish, balloon-shaped, transversely oblong, or rhomboidal, the end rounded, bearing one or two large, broadly gaping sori. South Pacific Islands. An ornamental, stove Maidenhair.

A. macrophyllum bipinnatum (bipinnate). This handsome variety differs from the type in having the fronds twice-pinnate in the lower part, and with smaller pinnules. Jamaica, 1885.

A. Mairisii (Mairis'). *fronds* triangular, quadripinnate; pinnæ ovate, on rather long stalks; pinnules cuneate-trapezoid, with an irregular, truncate apex, those near the ends of the pinnæ larger, with a lobate margin, the fertile ones cut into oblong, concave sinuses, giving a bluntly cornute aspect to the principal pinnule. 1885. Stove. Garden variety; perhaps a hybrid between *A. Capillus-Veneris* and *A. cuneatum.*

A. novæ-caledoniæ (New Caledonian).* *cau.* tufted. *sti.* and rachis blackish-purple, the latter clothed with dark brown hair-scales. *fronds* pedately pentagonal in outline, tripinnate at the basal part, bipinnate above; pinnæ narrow-lanceolate, the larger ones caudate; pinnules irregular in size and form, coarsely

Adiantum—*continued.*

toothed, the largest 1in. to 1¼in. long. New Caledonia. 1883. Stove. See Fig. 2, for which we are indebted to Messrs. W. and J. Birkenhead.

A. obliquum minus (lesser). *sti.* black. *fronds* pinnate; pinnæ falcate, acuminate, the sterile ones incised-toothed, the fertile ones with close-set, oblong sori, the apex trapeziform and lobed. Columbia, 1883.

A. Oweni (Owen's). *sti.* about 8in. long, glossy ebeneous. *fronds* about 1½ft. long, triangular-ovate, evergreen, glabrous, erect, quadripinnate; pinnæ ascending, triangular, stipitate, the lower ones on stalks about 1in. long, the upper ones gradually shorter; basal pinnules ovate; pinnulets very small, shortly stipitate, slightly lobed, the terminal ones cuneate, the others mostly rhomboid. *sori* two to four to a pinnule, placed in a sinus of the marginal lobes. Stove hybrid.

A. Pacottii (Pacott's). A garden variety, of very dense habit, the pinnules overlapping each other to an uncommon extent. Greenhouse.

A. rhodophyllum (rose-fronded).* *fronds* evergreen, triangular, tripinnate, elegantly spreading, about 1ft. long; pinnæ few, pinnate or bipinnate, the upper undivided ones 1½in. long, and, as well as the 1in. pinnules, rhomboid-trapezoid, and set on hair-like, black stalks; young fronds rosy-purple. *sori* at the apices of the lobes, but much broken up. 1884. A beautiful, stove hybrid.

Adiantum—*continued.*

A. roseum (rosy). *fronds*, when young, rosy-tinted. A dwarf, garden variety. Greenhouse.

A. schizophyllum (cut-leaved). *sti.* and rachises remote in varying degrees. *fronds* numerous, with stoutish, conspicuous, ebeneous rachises; pinnules small, commonly minute, most of them deeply cut into narrow, lineate lobes. *sori* small, lunate, sparingly produced in a perfect state. 1887. A seedling from *A. æmulum*. Stove or greenhouse.

A. tetraphyllum gracile (slender). A handsome variety, of moderate stature, remarkable for the beautiful reddish tint assumed by the fronds when first developed.

FIG. 2. ADIANTUM NOVÆ-CALEDONIÆ.

A. Victoriæ (Victoria's). *fronds* crowded, bipinnate, forming close, low tufts 4in. to 6in. high, rich green; pinnules rather large, bluntly conical or sub-rhomboidal. 1882 A handsome, dwarf, stove Maidenhair, "supposed to be a hybrid between *A. Ghiesbreghti* and *A. decorum*, but it appears more like a dwarf form of *A. tenerum Farleyense*" (Moore).

A. Waltoni (H. and E. H. Walton's). *sti.* 9in. long, glossy ebeneous. *fronds* nearly 1½ft. long, broadly ovate, erect, glabrous, evergreen, quadripinnate; pinnæ ascending, ovate, the lower ones long-stalked, the upper ones with the pinnules next the rachis elongated and compound; pinnulets pedicellate, more or less cuneiform, often somewhat oblique. *sori* abundant, four to six to a pinnule, placed in a sinus of the marginal lobes. Greenhouse hybrid.

Adiantum—*continued.*

A. Weigandii (Weigand's). *fronds* triangular, tripinnate, glabrous, about 1ft. long, forming a neat, tufted mass; pinnæ and pinnules long-stalked, the latter ovate from a broad base, lobed, with narrow sinuses. *sori* large, numerous, nearly circular, one or two on each lobe. America (garden origin), 1884. Greenhouse.

ÆCHMEA. Including *Macrochordium*. This genus comprises about sixty species, and is restricted to South America. To those described on p. 30, Vol. I., the following should now be added:

Æ. amazonica (Amazons). A synonym of *Karatas amazonica*.

Æ. Barleei (Barlee's). *fl.* distichous; calyx with a globose, mealy tube; corolla pale yellow; lower bracts red, upper ones green; stem central, paniculately branched. *l.* eight or nine in a rosette, lorate-ensiform, green, 2ft. to 3ft. long, 2in. broad, thinly white-lepidote, prickly on the margins. British Honduras, 1883.

Æ. brasiliensis (Brazilian). *fl.*, calyx, bracts, and rachis scarlet; petals blue, erect, emarginate-rounded at base; panicle contracted, oblong, 5in. long, highly glabrous, the branchlets sessile, short, two to six-flowered. *l.* recurved-spreading, ligulate-linear, much dilated at base, rigid, channelled, the margins spiny-toothed, acuminate, 1¾ft. to 3ft. long. Rio Janeiro, 1885. (R. G. 1202.)

Æ. Cornui (Professor Cornu's). *fl.*, calyx and bracts carmine-red; corolla yellow; inflorescence rather shorter than the leaves; scape red, with sparse, white tomentum. *l.* broad, ligulate, truncate and mucronate at apex, green, spotted brown towards the base and apex, the margins toothed. Brazil, 1885. A dwarf, robust species. (R. H. 1885, p. 36.)

Æ. ferruginea (rusty). *fl.* rosy-lilac, small, glomerulate; inflorescence paniculate. *l.* spreading, broad, ligulate, obtuse, denticulate, bright green, irregularly spotted with dull green. 1883. A large and robust species. SYN. *Hohenbergia ferruginea* (R. H. 1881, p. 437).

Æ. flexuosa (flexuous). *fl.* distant, sessile, erecto-patent; calyx pale pink, ⅓in. to ⅝in. long; petals bright red, lingulate, shortly protruded; panicle ovate, bipinnate, 1½ft. to 2ft. long, 6in. to 8in. in diameter, the lower branches 3in. to 4in. long; peduncle erect, stout, 1½ft. long; bracts pale, erect. Winter. *l.* twenty to thirty in a dense rosette 3ft. to 4ft. in circumference, lanceolate from a dilated base, bright green, horny, 3in. broad, channelled, with scattered, whitish spots. Native country unknown. 1886. Plant acaulescent.

Æ. Lalindei (Lalinde's).* *fl.*, calyx green, ellipsoid, pink at the tips; corolla not exserted; spike dense; bracts crimson, large, acute, reflexed; stem tall. *l.* 3ft. to 4ft. long, broad, concave, acute, denticulate, green. New Grenada, 1883. A handsome plant. (I. H. 481.)

Æ. macrantha (large-flowered). *fl.* yellowish, fading to black, sessile, in a small, globose head; peduncle white-woolly, shorter than the leaves, with long, narrow bracts. *l.* long, recurved and bent, spiny-toothed, dark, shining green above, densely white-punctate-striate beneath. Brazil, 1886. A fine Bromeliad. SYN. *Macrochordium macranthum* (R. G. 1886, p. 297, f. 34).

Æ. mexicana (Mexican). *fl.* on erecto-patent pedicels ¼in. long; calyx green, ½in. long; petals bright crimson, connivent, protruding ½in. from the calyx; panicle oblong-cylindrical, 1ft. long, 4in. to 5in. broad, the lower branches 2in. to 3in. long; peduncle stout, 1ft. long; bracts colourless, erect. Winter. *l.* twenty to thirty in a dense rosette, lorate, with a deltoid-cuspidate tip, above 2ft. long, 3in. broad, the dilated base 4in. to 5in. broad, pale green, with darker green spots; prickles small, the lower ones tipped with brown. Mountains of Orizaba, 1886.

Æ. myriophylla (many-leaved). *fl.* distichous; calyx bright red; corolla pink, fading to lilac; scape 1½ft. high, panicled above, and, as well as the bracts, bright red. *l.* forming a dense rosette, narrow, channelled, attenuated, 2ft. to 2½ft. long, 1in. broad, dull green, sprinkled with silvery scales on the back, the margins armed with close, brown prickles. Tropical America, 1887. (B. M. 6939.)

Æ. paniculigera (panicle-bearing). *fl.* disposed in a large, compound panicle 1ft. to 2ft. long; sepals rose-coloured; petals deep bright purple; scape several feet high, reddish-purple, clothed with white down. West Indies, 1887.

Æ. Weilbachii leodiensis (Weilbach's, Liège).* *fl.* violet-rose, changing to dark red; bracts scarlet, mixed with violet and green; scape shorter than the leaves. *l.* about forty in a rosette, the basal half armed with larger and more crowded spines than in the type, the upper surface dark olive and bright green, the basal part beneath washed violet-brown and spotted blood-red. Brazil, 1887.

AËRANTHUS. This genus embraces about six species. To those described on p. 31, Vol. I., the following should now be added:

A. Curnowianus (Curnow's). *fl.* yellowish-white; sepals and petals ligulate, acute; lip cuneate-obovate, retuse, with a median apiculus; spur filiform, five times as long as the lip. *l.* ligulate, emarginate, fleshy, dark, dull green, rather rough. Madagascar, 1883.

Aëranthus—*continued.*

A. Grandidierianus (Grandidier's). A synonym of *Angræcum Grandidierianum*.

A. Leonis (Leon Humblot's).* *fl.* ivory-white, comparable to those of *Angræcum sesquipedale*, but having a much shorter spur, which is funnel-shaped at the base, then filiform and bent abruptly upwards. *l.* numerous, sword-like, stout, falcate, 8in. to 9in. long. Comoro Islands, 1885. A grand plant. (G. C. n. s., xxiv., pp. 80-81; W. O. A. 213.) SYN. *Angræcum Leonis*.

A. trichoplectron (hair-spurred). *fl.* white; sepals lanceolate, acuminate; petals linear, acute; lip broad, nearly conchoid at base, acuminate at top; spur long, filiform; peduncle one-flowered. February. *l.* 5in. long, ⅓in. wide, soft, linear, bidentate at apex. Madagascar.

AËRIDES. To the species described on pp. 31-3, Vol. I., the following should now be added:

A. Ballantinianum (Ballantine's). *fl.* variable; dorsal sepal and petals somewhat toothed; lateral sepals white, with a purple eye-blotch at the top; lip white, with orange or self-coloured side lobes, or marked with purple streaks and transverse bars, the side lobes equal to, or shorter than, the mid-lobe, which is toothed at the sides and bidentate at the top. *l.* rather short, bilobed. A fine species.

A. Bernhardianum (Bernhard's). *fl.*, side lobes of the lip overlapping each other, the front lobe covering both in front; raceme having the appearance of that of *A. quinquevulnerum*. *l.* narrow, strap-shaped. Borneo, 1885. A distinct and fine species.

A. Burbidgei splendens (Burbidge's splendid). *fl.* rich purple; side lobes of the lip ochre, spotted with brown; tip of the spur ochre. 1885.

A. Emericii (Emeric Berkeley's). *fl.* pale pink, with darker tips to the perianth segments and purple mid-lobe of the lip, numerous, ½in. in diameter; perianth segments short, incurved, with rounded tips; lip funnel-shaped, passing into the stout, incurved spur; raceme axillary, 5in. to 6in. long, shortly pedunculate. May. *l.* distichous, nearly 1ft. long, 1in. to 1½in. broad, linear, coriaceous, deeply bifid at apex. Andaman Islands, 1882. (B. M. 6728.)

A. expansum (expanded). *fl.*, sepals and petals creamy-white, with purple markings; lip fully expanded, having amethystine blotches on the lateral lobes and on the sides of the middle lobe, the broad anterior portion of which is deep purple, and the spur greenish; racemes elongated. June and July. *l.* broader than in *A. falcatum*, and light green. India. SYN. *A. falcatum expansum*.

A. e. Leoniæ (Mrs. Leonie Allan Goss'). *fl.*, side laciniæ blunt, retuse, even dolabriform. 1882.

A. falcatum compactum (compact). A variety differing from the type principally in its shorter inflorescence, shorter and broader leaves, and thicker and stronger stems.

A. f. expansum (expanded). A synonym of *A. expansum*.

A. formosum (beautiful). *fl.* white, spotted, disposed in graceful, pendent spikes; lip trifid, beautifully coloured with amethyst. 1882. A handsome hybrid, supposed to have been bred between *A. falcatum* and *A. odoratum*.

A. Godefroyanum (Godefroy's). *fl.* light rosy-white, streaked and spotted with amethyst on the sepals and petals, comparable with those of *A. maculosum*; lip triangular, with a retrorse, hooked, solid tooth, and a very small, angular spur, the disk rich amethyst. Cochin China, 1886.

A. illustre (illustrious). *fl.* resembling those of *A. maculosum*, but larger; sepals and petals broader, with a lilac hue over the white, the few blotches mostly on the inner side of the petals; lip rich amethyst-purple, with the basal markings of *A. maculosum*; racemes unbranched. *l.* broad, dark-spotted. India (supposed to be a natural hybrid).

A. Lawrenceanum (Sir Trevor Lawrence's). *fl.* white, large, with a bold, convex, scoop-shaped lip of a bright magenta-rose; spikes drooping. *l.* rather narrow-linear. 1882.

A. Lawrenciæ (Lady Lawrence's). *fl.* nearly as large as those of *A. crispum*; sepals and petals white, changing to yellowish, tipped rosy-purple; lip having its side lobes high, oblong-dolabriform, its central lobe tipped rosy-purple, two purple lines running back to the mouth of the spur, which is conical, acute, entire; racemes 2ft. long, bearing upwards of thirty flowers. Tropical Asia, 1882. (W. O. A. vi. 270.)

A. Leeanum (W. Lee's). *fl.* amethyst-coloured, with a green spur, sweet-scented; racemes short and dense. Winter. An Indian species, allied to *A. quinquevulnerum*.

A. lepidum (charming). *fl.* white, as large as those of *A. affine*; sepals and petals tipped with purple; lip having the projected anterior part purple; spur cylindrical, curved; racemes ascending, many-flowered. *l.* lorate, obtusely bilobed. India. A pretty species.

A. Lobbii Ainsworthii (Ainsworth's). *fl.* brighter-coloured than in the type; spikes about 2ft. long. Moulmein. A fine variety.

A. maculosum formosum (beautiful). *fl.* large and numerous; sepals and petals white, marked with numerous rose-purple spots; lip white at base, marked on the crests and auricles with rose

Aërides—*continued.*

purple lines, the large, elliptic front lobe entirely rose-purple. 1885. A fine form.

A. margaritaceum (pearly). *fl.* pure white, produced in spikes. Summer. *l.* spotted. India. A pretty species, something in the way of *A. maculosum*.

A. marginatum (margined). *fl.* densely packed on the rachis; sepals and petals pale yellow, the anterior border purple; side lobes of lip semi-oblong, deep orange, the central one oblong-ligulate, toothleted, yellow, changing to sepia-brown; spur light green, conical; racemes drooping. *l.* rather broad, lorate, bilobed or emarginate, keeled on the under side. Philippine Islands, 1885.

A. McMorlandi (McMorland's). *fl.* white, spotted with peach-colour, freely produced in long, branched racemes. June and July. *l.* bright green, nearly 1ft. long. India. A fine but rare species.

A. odoratum birmanicum (Birma). *fl.* smaller than in the type; lateral sepals having a light purple line outside; middle lacinia of the lip purple, very narrow, with a few teeth at the margin; side laciniæ apicular. 1887.

A. o. Demidoffi (Demidoff's). *fl.* white, large, forming a rich spike; tips of the sepals, petals, and lip marked with purple; spur spotted with purple, and tipped with green. 1885. Stem.

A. Ortgiesianum (Ortgies'). *fl.*, sepals and petals blotched and warted with purple; side segments of the lip purple, the middle one white, blunt, bilobed, not serrated, the spur green, all dotted and barred red. 1885. This looks like a small *A. quinquevulnerum*.

A. pachyphyllum (thick-leaved). *fl.* resembling those of *A. Thibautianum*, few in a short raceme; sepals and petals light crimson-lake, nearly as large as in that species, oblong-ligulate; laciniæ of the lip small, painted with more or less warm purple; spur prominent, and, as well as the column, white. *l.* very fleshy, short. Birma, 1880.

A. quinquevulnerum Schadenbergiana (Schadenberg's). A variety of more compact habit, having shorter and broader leaves than the type. 1886.

A. Reichenbachii cochinchinensis (Cochin China). *fl.*, inflorescence denser than in the type; yellow of the lip much deeper. Cochin China. A grand variety.

A. Roebelenii (Roebelen's). *fl.* very fragrant, the size of those of *A. quinquevulnerum*; sepals and petals greenish-white, tipped with white; petals often minutely toothed; lip rosy, with yellow, oblong side lobes lacerated on the upper edge, as is also the much longer, oblong, curved middle lobe; spur short, conical; racemes erect, 1ft. long, about twenty-five-flowered. Philippine Islands, 1884. Habit of *A. quinquevulnerum*.

A. Rohanianum (Prince Camille de Rohan's). *fl.*, sepals whitish-rose or rose-mauve, always bordered white; laciniæ of the lip white, with two purple lines running over the middle and purple blotches, the central laciniæ nearly rhomboid, bilobed at apex, with some small crenulations, the side laciniæ cuneate and retrorse; spur sulphur or orange, with numerous purple spots, bent forwards; inflorescence very long. 1884.

A. Sanderianum (Sander's). *fl.* 1½in. across; sepals and petals creamy-white, tipped magenta, recurved at the margin; lip large, the upper half of the side lobes yellow, frilled at the edges, the middle lobe obovate, folded, magenta; spur greenish-yellow at the end; racemes long. *l.* broad, short, retusely bilobed. Eastern tropical Asia, 1884.

A. suavissimum maculatum (spotted). *fl.* delightfully fragrant; sepals and petals white, profusely spotted with pink, as is also the lip.

A. Thibautianum (Thibaut's). *fl.*, sepals and petals rose-coloured; lip bright amethyst; raceme very long, with the flowers rather openly set upon it. Java. Allied to *A. quinquevulnerum*.

A. Veitchii (Veitch's). *fl.* white, dotted with soft rose-pink; racemes long, drooping, branched. June and July. *l.* 8in. long, dark green, spotted. Allied to *A. affine*. (B. H. 1881, 8-9.)

A. virens Dayanum (Day's). A fine variety, with very long racemes. India.

A. v. grandiflorum (large-flowered). *fl.* white, spotted with pink, larger and more gracefully disposed than in the type. April and May. India.

A. v. superbum (superb). *fl.* brighter, and spikes longer, than those of the type. India.

A. Wilsonianum (Wilson's). *fl.*, sepals and petals pure white; lip lemon-yellow. A distinct, dwarf species, in appearance much resembling *A. odoratum*.

AGALMA VITIENSIS. *See* **Heptapleurum vitiense.**

AGANISIA. The half-dozen species of this genus are confined to tropical America. To those described on p. 35, Vol. I., the following should now be added:

A. cyanea (blue). *fl.* rather small, in a short, erect raceme; sepals and petals white, ovate, acute; lip blue, roundish-cuneate,

Aganisia—*continued.*

undulated at the tip; scapes slender. June. *l.* evergreen, forming a close, upright tuft, broadly lanceolate, strongly ribbed. Columbia. SYN. *Warrea cyanea* (B. R. 1845, 28).

A. c. alba (white). *fl.* pure white. 1885.

A. tricolor (three-coloured). *fl.* closely resembling those of *A. cyanea*, but the sepals are whitish on both sides, the petals are light blue, and the callus of the saddle-shaped, orange-brown lip is different in shape. Amazons, 1886. A fine Orchid.

AGAVE. Upwards of 120 species have been described, but, according to Bentham and Hooker, not more than fifty are sufficiently distinct to rank as such; they are distributed over South America, Mexico, and the Southern United States. To those described on pp. 38-42, Vol. I., the following should now be added:

A. Alibertii (Alibert's). *fl.* 1in. long, on short pedicels; perianth tube greenish, funnel-shaped, the segments short, lanceolate-deltoid; peduncle (including the lax, simple raceme) 4ft. to 5ft. high. *l.*, produced ones ten to twelve, lanceolate, denticulate, forming a rosette. Native country unknown. 1877. SYN. *Alibertia intermedia*.

A. Baxteri (Baxter's). *fl.* disposed in a thyrsoid, loose panicle 4ft. to 5ft. long; perianth tube yellow, ⅓in. long, dilated at the middle; filaments ⅔in. to 1in. long; anthers linear, ⅓in. long; ovary cylindrical-trigonous, 1in. long; peduncle 4ft. to 5ft. long before the flowers appear. March. *l.* about thirty in a dense, sessile rosette, oblanceolate, about 1ft. long, and 3in. across at the widest part, the tip pungent, brown, shortly decurrent, the marginal spines spreading, hooked, deltoid-cuspidate, brown, about ⅛in. long. Mexico (?).

A. bracteosa (bracted). *fl.* in pairs, forming a dense spike; perianth segments about ½in. long, the ovary slightly longer; stamens about 2in. long; stem 3ft. high, the flowerless part densely covered with spreading or recurved bracts 5in. to 6in. long. *l.* ten to fifteen, broadly linear-attenuate, 1½ft. to 1¾ft. long, 1½in. broad at base, the margins minutely serrulated. Monterey, Mexico, 1883. (G. C. n. s., xviii., p. 776.)

A. Henriquesii (Henriques'). *fl.*, perianth segments tinged dark brown, lanceolate, 1in. long; style purplish-brown; panicle spike-like; peduncle, including the inflorescence, 12ft. to 14ft. long. *l.* in a dense rosette, oblong-lanceolate, bright green, margined with dark brown, 2ft. long, 5in. broad, narrowed to the base and to the pungent apex, armed with spreading prickles. Mexico (?), 1887. (G. C. ser. iii., vol. ii., p. 307.) SYN. *Littæa Henriquesii*.

A. Morrisii (Morris'). *fl.*, perianth bright yellow, 2in. to 2½in. long; stamens nearly twice as long as the segments; panicle thyrsoid, the main branches 1½ft. long; peduncle, including the inflorescence, 15ft. to 20ft. long. *l.* twenty or more in a dense rosette, oblanceolate-spathulate, 6ft. to 7ft. long, nearly 1ft. broad, gradually narrowed to the pungent-spiny apex, dull green, the margins prickly. Jamaica, 1887. (G. C. ser. iii., vol. i., p. 549.)

A. Villarum (Villa Brothers'). *l.* quite spineless, as in *A. filifera*, but much longer, more spreading, and less dense. 1886. An Italian hybrid between *A. filifera* and *A. xylonacantha*, the former being the seed-bearer.

A. Wiesenbergensis (Wiesenberg). *fl.* erect, tubular, six-parted, 1¼in. long, disposed in clusters along the side of a long flower-stalk. *l.* 8in. long, 2¼in. broad, upwards of ¼in. thick, oblong-lanceolate, mucronate, with remote, spiny teeth on the margins. 1885.

AGERATUM. This genus embraces about sixteen species of herbs and shrubs, natives of tropical or sub-tropical America, one being broadly distributed over the warmer regions of the globe. To those described on p. 42, Vol. I., the following should now be added:

A. Wendlandi (Wendland's). *fl.* blue, with rosy reflections, produced in abundance. *l.* cordate, dark green. Stems hairy. Mexico, 1885. A dwarf, compact species.

AGLAONEMA. About a score species—all tropical—are included here. Spadix sessile or stipitate; spathe straight, at length marcescent; peduncles fascicled. Leaves ovate- or oblong-lanceolate. To the species described on p. 42, Vol. I., the following should now be added:

A. acutispathum (acute-spathed). *fl.*, spadix sessile, 1⅜in. long; spathe light green, 3½in. long, 1½in. broad, ovate-lanceolate, acuminate, widely expanded; scape as long as the petioles. *l.* 6in. to 8in. long, 2½in. to 3½in. broad, elliptic-ovate, acuminate, slightly oblique, rounded and slightly cuneate at base, the apex gradually attenuated into a fine point 1in. long; petioles 3in. to 4½in. long, sheathing. Hong Kong (?), 1885. Nearly hardy.

A. nebulosum (clouded). *l.* 5in. to 8in. long, 1in. to 1½in. broad, oblong or obovate-oblong, obliquely cuspidate-acuminate at apex,

Aglaonema—*continued.*

obtuse at base, green, irregularly marked with greenish-white above; petioles 1½in. to 2in. long, channelled above, sheathed. Java, 1887. (I. H. ser. v. 24.)

A. pictum compactum (compact). *fl.*, spathe green, pointed, the outer surface shining. *l.* short, oblong-ovate, acuminate, unequal-sided, dark sap-green, sparingly blotched grey; petioles sheathing, green, with a membranous, whitish margin. Stems very short, erect. Java, 1888.

AGONIS (from *agon*, a gathering, a collection; in allusion to the number of the seeds). SYN. *Billiottia.* ORD. *Myrtaceæ.* A genus comprising ten species of greenhouse, evergreen shrubs or small trees, natives of West Australia. Flowers rather small, sessile, in dense, globose, axillary or terminal heads; calyx segments five, often scariose; petals five, spreading; stamens free, sometimes ten, opposite and alternate with the petals, sometimes twenty or more; bracts imbricating, often involucrate. Leaves alternate, often crowded on the branchlets, small or narrow and coriaceous, entire. *A. flexuosa* and *A. marginata* are rare in this country, but are grown at Kew. They should be firmly potted in a compost of turfy loam and peat, with a liberal addition of sand. Water must be frequently given during the growing season, but more sparingly during winter. In autumn, the plants may be placed in a sheltered and sunny position, to ripen their wood and induce the formation of buds. In the South of England, these plants may prove hardy. Propagation may be effected by cuttings of the half-ripened shoots, inserted in sandy peat, under a bell glass.

A. flexuosa (flexible). *fl.-heads* white, axillary, surrounded by broad bracts, which, with the numerous long, white stamens, are the most attractive features of the inflorescence. Summer. *l.* lanceolate, like those of the Willow, smooth, dark green, the margins tinged with purple. *h.* (in Australia) 40ft.; may be limited to the size of a small pot shrub. (Gn. xxix. 534.)

A. marginata (margined). *fl.-heads* white, axillary and terminal, about twenty-flowered; petals small; stamens long, hair-like. Summer. *l.* coriaceous, slightly hairy, in other respects like those of the common Box. Branches twiggy, numerous, the youngest ones silky-hairy.

AJUGA. The species of this genus number about thirty, and are distributed over extra-tropical regions. To those described on p. 45, Vol. I., the following variety should now be added:

A. reptans variegata (variegated). *l.* glaucous-green, with a broad, white edging.

ALBUCA. About thirty species are known, all natives of South and tropical Africa, and requiring greenhouse treatment except where otherwise stated. To those described on p. 45, Vol. I., the following should now be added:

A. corymbosa (corymbose-flowered). *fl.* five or six in a lax corymb; perianth yellow, banded green, the inner segments hooded, connivent; outer stamens having no anthers; peduncle 6in. long. *l.* six to eight, terete, 1ft. or more in length. 1886.

A. juncifolia (Rush-leaved). *fl.* greenish-yellow, inodorous, drooping, ten to fifteen in a deltoid panicle 4in. to 5in. long; perianth 1in. long. August. *l.* twenty to thirty, sub-terete, 1ft. long, ⅛in. to ¼in. in diameter, tapering to a point. 1876. (B. M. 6395.)

A. Wakefieldii (Wakefield's). *fl.* pale green, ten to twelve in a lax raceme 6in. to 9in. long; perianth 1in. long, the inner segments bordered white; scape longer than the leaves. Autumn. *l.* four or five, linear-ensiform, flaccid, glabrous, 1ft. to 1½ft. long, 1in. broad at base, tapering to a point. Eastern tropical Africa, 1878. Stove. (B. M. 6429.)

ALIBERTIA INTERMEDIA. A synonym of **Agave Alibertii** (which *see*).

ALLAMANDA. A dozen species have been referred to this genus; but the rank of some of them is very uncertain; they inhabit South America, one extending as far as Central America. The under-mentioned is the only plant calling for addition to those given on pp. 47-8, Vol. I.

A. cathartica Hendersoni (Henderson's). *fl.* orange-yellow, with five white spots at the throat, tinged brown outside, the lobes finely formed, immensely thick and wax-like. (R. G. 1887, pp. 560-1, f. 142.) SYN. *A. Hendersoni* (F. M. 1866, 263; I. H. 1865, 452).

A. Hendersoni (Henderson's). A variety of *A. cathartica.*

ALLIUM. This genus embraces about 250 species, mostly inhabiting Europe, North Africa, Abyssinia, and extra-tropical Asia, but many are found in North America and Mexico. To those described on pp. 48-9, Vol. I., the following should now be added:

A. amblyophyllum (obtuse-leaved). *fl.* lilac; perianth segments lanceolate, acute; umbel about 1½in. in diameter, globose. Summer. *l.* five or six, broad, linear, obtuse, flat, spaced along the stem. Bulb small. Turkestan, 1885. A rather distinct species, of dwarf habit. (R. G. 1190.)

A. Backhousianum (Backhouse's). *fl.* white, in a dense, globose head; perianth segments narrow-linear and totally reflexed; stamens united into a cup at the base. *l.* radical, bluish-white. *h.* 3ft. to 4ft. Himalayas, 1885. A tall species, resembling *A. giganteum.* (R. G. 1885, 215.)

A. elatum (tall). *fl.* purple, numerous, disposed in a large, globose head; perianth segments spreading, oblong, obtuse; scape stout, 3ft. or more high. *l.* oblong, obtuse, 8in. to 12in. long, 2in. to 4in. broad. Central Asia, 1887. (R. G. 1251.)

A. giganteum (gigantic). *fl.* numerous, forming a dense, globose umbel 4in. in diameter; perianth bright lilac, ¾in. long, the segments widely spreading; peduncle erect, 3ft. to 4ft. long. June. *l.* six to nine, springing from the base of the peduncle, lorate, flaccid, glaucescent, 1½ft. long, 2in. broad in the middle. Bulb globose, 2in. to 3in. in diameter. Merv, 1883. (B. M. 6828; R. G. 1113.)

A. Holtzeri (Holtzer's). *fl.* many, in a capitate, hemispherical umbel 1½in. in diameter; perianth white, the segments elliptic-oblong, acute, with a green middle nerve; anthers red; ovary green, prominent; scape flexuous, 5in. to 7in. long. *l.* filiform, more or less terete, equalling or exceeding the scape, glabrous. Bulb fascicled-tufted, oblong-cylindrical. Turkestan, 1884. (R. G. 1169, a-c.)

A. Macleanii (Maclean's). *fl.* in a dense, globose umbel 3in. to 4in. in diameter; perianth mauve-purple, ¾in. long, the segments oblong-lanceolate, acute; spathe valves two, membranous; peduncle flexuous, 2ft. to 3ft. long. Summer. *l.* four or five, evanescent, lanceolate, about 1ft. long, 1in. to 1½in. broad, glabrous. Cabul, 1882. (B. M. 6707.)

A. macranthum (large-flowered). *fl.* fifty or more in a loose, globose umbel 3in. to 4in. in diameter; perianth bright mauve-purple, nearly ½in. long, permanently campanulate; pedicels 1½in. to 2in. long; scapes several in a tuft, 2ft. to 3ft. long. July. *l.* numerous, linear, thin, 1ft. to 1½ft. long, tapering gradually to a long point. Rootstock indistinctly bulbous, with a dense tuft of fleshy root-fibres. Eastern Himalayas, 1883. (B. M. 6789.)

A. Ostrowskianum (Ostrowsky's). *fl.* rose-coloured, disposed in a many-flowered umbel; scape 8in. to 12in. high. *l.* two or three, linear, flat, flaccid, acute, glaucous. Turkestan, 1883. (R. G. 1089.)

A. oviflorum (ovate-flowered). *fl.* deep violet-purple, ovate-conical, nodding; sepals connivent; umbel lax, roundish; scape acutely four to six-angled. *l.* produced at the apex of the short, ebulbous stems, sub-biseriate, lax, keeled, glabrous. Chumbi Valley, India, 1883. A pretty and interesting plant. (R. G. 1134.)

A. Semenovi (Semenow's). *fl.* yellow, on very short pedicels; outer perianth segments longer than the inner ones; stamens very short, united in a tube round the ovary; umbel small, dense; scape usually shorter than the leaves. *l.* glaucous, fistular, flat on the face, rounded at back. Alatau Mountains, 1884. (R. G. 1156.)

A. Suworowi (Suworow's). *fl.*, perianth dark mauve-purple, ¾in. long, the segments keeled with green; umbel very dense, globose, 2in. to 3in. in diameter; scape stout, erect, 2ft. long. May and summer. *l.* six or seven in a basal rosette, ensiform, 1ft. to 1½ft. long, 1in. broad, glaucous-green, flaccid. Central Asia. (B. M. 6994.)

ALNUS. About fourteen species—broadly dispersed over Europe, Central and North Asia, North America, and the Andes of South America, are here included. The only British species is *A. glutinosa.* To those described on p. 50, Vol. I., the following should now be added:

A. japonica (Japanese). *fl.*, catkins ellipsoid, obtuse, ½in. to ¾in. long, nearly or quite ½in. thick. *l.* elliptic or elliptic-ovate, acuminate, serrated, acute at base, 2in. to 4in. long, 1in. to 2in. broad. Japan, 1886. Tree.

ALOCASIA. In addition to the score of species, natives of tropical America and the Malayan Archipelago, there is now a good selection of hybrid Alocasias. To those described on pp. 50-1, Vol. I., the following should now be added:

A. Augustiana (Auguste Linden's). *l.* peltate, repand, green, the primary nerves paler, as is also the under surface; petioles 1ft. to 1½ft. long, ¾in. to 1¼in. thick at base, terete, rosy, with brown hieroglyphic spots. 1886. (I. H. 1886, 593.)

Alocasia *continued*

A. Chantrieri (Chantrier's). *l.* about 1ft. long and 6in. broad, [illegible], peltate, with undulated margins, deep olive-green above, the veins narrowly bordered with silvery white; under surface deep violet-red; petioles slightly dilated, with sheathing base, cylindrical, green, lightly barred with olive. A hybrid between *A. metallica* and *A. Sanderiana*. (R. H. 1887, p. 96.)

A. eminens (eminent). *fl.*, spathe tube light green, 1½in. long, the lamina greenish-white, veiny, 3½in. to 4in. long, reflexed; spadix light green and creamy-white, 3½in. to 4½in. long; peduncles in pairs (? always), 1ft. to 1½ft. long. *l.* peltate, ovate-sagittate, 20in. to 22in. long, 9in. to 10½in. broad, dark green above, the under surface purple, with very pale midrib and primary veins; petioles 3½ft. to 4½ft. long, terete, 1in. thick at [illegible], olive-green, with a coppery hue, and barred blackish-green. East Indies, 1887.

A. grandis (large). *fl.*, spathe white, marked with carmine lines on the outside, having a short, mottled green tube; peduncles about 15in. long. *l.* ovate-sagittate, 1½ft. to 2ft. long, 1ft. broad, bright green above, blackish-green beneath; petioles blackish, [illegible] Archipelago, 1886. A noble and [illegible]

A. guttata imperialis (imperial). *fl.*, spathe white, spotted [illegible] on the tube. *l.* elliptic-sagittate, acute, 1ft. to 1½ft. long, ½ft. to 1ft. broad, dark green above, with slightly paler spaces between the nerves, purplish beneath. Borneo, 1885. A fine, stove, foliage plant. (I. H. 1884, 341.)

A. Lindeni (Auguste Linden's). *l.* 8in. long, 4½in. to 6in. broad, glabrous, green above, with yellowish-white midrib and principal veins, paler beneath, cordate-ovate, very long-acuminate at base, the sinus large, triangular; petioles white or green-ish-white, 16in. to 18in. long, ½in. to ¾in. thick, erect, terete, channelled, atupl-exieaul, with decurrent sheaths half their length. Malaya, 1886. (I. H. 1886, 993.)

A. Luciani (Lucien Linden's). *l.* peltate, ovate, cuspidate at apex, obcordate at base, dark green above, with pale [illegible] veins and margins, purple beneath; basal lobes ovate-deltoid; petioles [illegible] (I. H. ser. v. 2.)

A. Margaritæ (Marguerite's). *l.* large, obcordate, peltate, repand, rather thick, bullate, highly glabrous above, except on the blackish midrib and primary veins; sinus triangular, the apex at the junction of the petiole; petioles terete, puberulous, brownish-purple, sheathing at base, the sheaths rosy-margined. Java, 1886. (I. H. 1886, 611.)

A. marginata (margined). *fl.*, spathe tube green, 1in. to 1½in. long, [illegible] lamina pale greenish-white, usually striped and spotted [illegible] purple at back; spadix white, 6in. to 7in. long. *l.* 1½ft. to 2ft. long, 12in. to 14in. broad, broadly cordate-ovate, slightly sinuate-margined, rounded into a shortly-pointed apex; petioles 2ft. to 2½ft. long, with zigzag marks of blackish-brown, the sheaths broadly margined with blackish-brown. Brazil, 1887.

A. princeps (princely). *l.* sagittate, the hinder lobes narrow and spreading, forming a triangular, open sinus, the margins deeply [illegible], the upper surface of a metallic olive-green, with darkened midrib and [illegible] primary veins, the under surface greyish-green, with dark chocolate-brown veins and margin; petioles slender, greyish-green, heavily marbled chocolate-brown. Malayan Archipelago, 1886.

A. Pucciana (Signor Pucci's). *l.* peltate, oval-sagittate, 1½ft. long, about 9in. broad, deep green above, the pure white veins sur-[illegible] [illegible] [illegible] [illegible] indrical, pale purplish, marked with [illegible] small crimson-red; in the upper portion [illegible] 1887. Garden hybrid.

A. Putzeysi [illegible] [illegible] [illegible]

ALSOPHILA. Upwards of ninety species have been referred to this genus. To those described on pp. 54-6, Vol. I., the following variety should now be added:

A. atrovirens Keriana (Ker's dark green). *sti.* 6in. to 8in. long, dull brown, muricated. *fronds* oblong-lanceolate, bipinnate, 1¼in. to 1½in. long, 6in. broad, firm, pilose on the main veins beneath; pinnæ lanceolate, the lower ones 3in. to 4in. long, ⅜in. to 1in. broad, cut down to the rachis into oblong, crenate, obtuse pinnules. *sori* placed at the forking of the veins. 1884. Stove.

ALYSSUM. This genus comprises from eighty to ninety species, natives of Asia Minor, South Europe, Persia, North Africa, the Caucasus, and Siberia. To those described on pp. 60-1, Vol. I., the following should now be added:

A. pyrenaicum (Pyrenean). *fl.* white, with chocolate-coloured anthers. June to August. *l.* roundish. Habit dwarf, tufted.

ALYXIA (said to be the native Indian name of one of the species). SYN. *Gynopogon.* ORD. *Apocynaceæ.* A genus embracing about thirty species of stove, often glabrous shrubs, inhabiting Eastern tropical Asia, the Malayan Archipelago, Ceylon, Madagascar, tropical Australia, and the Pacific Islands. Flowers rather small, twin or cymose; calyx five-parted, glandless; corolla salver-shaped, with a cylindrical tube and five twisted lobes; stamens included. Leaves whorled in threes or fours, or rarely opposite, coriaceous, shining, penniveined. The best-known species are here described. They thrive in a mixture of sandy loam and a little peat. Cuttings of ripened wood will root freely if inserted in pots of sand, under glass, and plunged in heat.

A. bracteolosa (slightly bracteate). *fl.* pale yellow, with a long tube; cymes axillary, many-flowered, shortly pedunculate. *l.* in threes, oblong or sub-lanceolate, obtuse or acuminate at apex rounded or acute at base. Fiji, 1887. Climber.

A. daphnoides (Daphne-like). *fl.* yellowish-white, sessile, axillary and terminal, solitary. April. *l.* in fours, obovate-oblong, elliptic, or rhomboid, obtuse, shining, ¼in. to ⅜in. long. *h.* 4ft. Norfolk Island, 1831. (B. M. 3313.)

A. ruscifolia (Butcher's-broom-leaved). *fl.* white, small, sessile, in sessile, terminal heads. July. *l.* whorled, broadly ovate-elliptic to narrow-lanceolate, acute, with a short, pungent point, ⅜in. to 1½in. long, shortly petiolate, the margins recurved or revolute. Australia, 1820. A tall, handsome shrub. (B. M. 3312; L. B. C. 1811.)

AMARABOYA (the native name). ORD. *Melastomaceæ.* A small genus (three species) of erect, glabrous, stove or greenhouse, evergreen shrubs, natives of New Grenada. Flowers showy, cymose; petals usually six, cordate; stamens twelve to fifteen. Leaves large, opposite, sessile, with three very prominent nerves, green above, reddish-carmine beneath. Branches as thick as the thumb, bluntly four-angled. The species will probably thrive under the same treatment as that recommended for **Pleroma** (which *see*, on p. 162, Vol. III.).

A. amabilis (lovely). *fl.* white, margined with carmine, large; petals broad; style red, elongated; umbels terminal. *l.* 10in. to 12in. long, 8in. broad, opposite, elliptic, canescent beneath, the three nerves brownish or reddish. Stems terete, purplish. 1887. (I. H. ser. v. 9.)

A. princeps (princely). *fl.* of a uniform bright carmine, very showy; petals usually six, broadly cordate; stamens white; cymes terminal, few-flowered; peduncles stout. *l.* elliptic, sessile, apiculate, 7in. to 10in. long, 3in. to 5in. broad, green above, reddish-brown beneath. 1887. (I. H. ser. v. 4.)

A. splendida (splendid). *fl.* 6½in. across, very beautiful; petals sub-triangular, 3in. long, nearly 2½in. broad, at first reddish-pink, becoming white in the lower part; stamens yellowish; style red, elongated. *l.* very large, ovate-oblong, green above, coppery-pink with three red nerves beneath. 1886. A gorgeous plant. (I. H. ser. v. 34.)

AMORPHOPHALLUS. Including *Hydrosme.* This genus comprises about twenty-five species, inhabiting tropical Asia and Africa, the Malayan Archipelago, and the Pacific Islands. To those described on p. 65, Vol. I., the following should now be added:

A. Leopoldianus (Leopold II.'s). *fl.*, spathe reddish-violet, expanded, shortly pedunculate, the lamina oval-lanceolate, long-acuminate, the margins undulated; spadix 2ft. to 2½ft. long, cylindrical. *l.* horizontally spreading, 2½ft. to 3ft. in diameter,

Amorphophallus—*continued.*

trifariously palmately divided, the divisions bisected; segments oblong-lanceolate, loosely and irregularly bi-tripinnatisect, the ultimate segments 1½in. to 2½in. long; petioles about 1½ft. high, terete, dotted. Congo, 1887. SYN. *Hydrosme Leopoldiana* (I. H. ser. v. 23).

A. Teuszii (Teusz's). *fl.*, spathe green outside, dark purple-brown within, 6in. long, with a short, ovoid tube, and an open, trifid limb; spadix rather shorter than the spathe, with a greenish, cylindric appendix; peduncle very short. *l.* solitary, tripartite, with bipinnatifid-branched divisions; ultimate segments linear-lanceolate. Western tropical Africa, 1884. SYN. *Hydrosme Teuszii* (R. G. 1142).

A. virosus (venomous). *fl.*, spathe externally pale green, spotted white and margined purple, within purple at the rugose base, rich cream in the middle, and purple in the upper part, 9in. long, 6in. in diameter; spadix about 7in. long, with a brownish or purplish, sub-globose, rugulose appendix. Siam, 1885. Much like *A. campanulatus*, but with a smaller inflorescence.

AMPELOPSIS. Botanically, this is merely a section of the genus *Vitis.* To the species described on pp. 65-6, Vol. I., the following variety should now be added:

A. Hoggi (Dr. Hogg's). A large-leaved, vigorous-growing form of *A. tricuspidata.* 1888.

ANACYCLUS (changed from *Ananthocyclus*, compounded of *a*, privative, *anthos*, a flower, and *kyclos*, a circle; with reference to the circle of ovaries which surrounds the disk). ORD. *Compositæ.* A genus embracing about ten species of hardy or half-hardy, annual herbs (or with a perennial caudex), inhabiting South Europe, North Africa, and the Orient. Flower-heads radiate, mediocre, pedunculate at the tips of the branches; involucre hemispherical or broadly campanulate, the bracts in few series; receptacle convex or conical; ray florets white, yellow, or purplish, in one series, fertile or sterile, sometimes deficient; disk yellow, fertile; achenes obovate, glabrous, the outer ones two-winged. Leaves alternate, twice or thrice pinnatisect. *A. radiatus purpurascens*, the only plant of the genus in general cultivation, is a very attractive and floriferous, hardy annual, thriving under ordinary treatment.

A. radiatus purpurascens (rayed, purplish). *fl.-heads* large; ray florets white or yellow above, the under side purplish. Summer. *l.* bipinnatifid, with small, linear segments. 1883. (R. G. 1074.)

ANAGALLIS. This genus embraces about a dozen species, inhabiting Europe, North and South Africa, West Asia, and extra-tropical South Africa, one being scattered over nearly all warm and temperate regions. To those described on pp. 68-9, Vol. I., the following variety is the only plant calling for addition:

A. collina alba (hill-loving, white). *fl.* white, yellow in the centre, abundantly produced. April to June. *l.* small, lanceolate. Stems short, erect, crowded, densely set with leaves. 1883. A charming little hardy perennial. (R. G. 1125.)

ANANAS. The five or six species of this genus are all tropical American. To those described on p. 69, Vol. I., the following should now be added:

A. crocophylla. *fl.* green, small, in a compact, spherical head; bracts spiny-edged. *l.* clear green, spotted and marbled dark green; at the flowering period the outer ones assume a beautiful rose-colour, while the inner ones retain their ordinary colour. Stem 3ft. high. Brazil, 1885. SYN. *Chevaliera crocophylla.*

ANDROSACE. This genus embraces about forty species, confined to the Northern hemisphere. To those described on pp. 72-3, Vol. I., the following should now be added:

A. foliosa (leafy). *fl.* many in an umbel; corolla pale flesh-coloured, ⅛in. to ¼in. in diameter; scape solitary, erect, 3in. to 5in. high. May to September. *l.* 2in. to 3in. long, elliptic or elliptic-oblong, obtuse or acute, hairy. Rootstock woody, without stolons, sending up one or more very short stems. Western Himalaya, 1882. (B. M. 6661.)

A. rotundifolia macrocalyx (round-leaved, large-calyxed). *fl.* numerous; calyx ⅛in. to ⅜in. in diameter; corolla pale rose-coloured, much shorter than the calyx; scapes slender, longer than the leaves. June. *l.* radical, 1in. to 2in. in diameter, orbicular-cordate, lobulate; petioles equalling the blades. Himalaya, 1882. A softly hairy perennial, without stolons. (B. M. 6617.)

ANEMONE. Of the seventy species comprised in this genus, the great majority inhabit the temperate, frigid, or mountainous regions of the Northern hemisphere; a few are found in South America and South Africa, and one is a native of Australia. To those described on pp. 74-8, Vol. I., the following should now be added:

A. baikalensis (Baikal). *fl.* snow-white inside, suffused rose-pink outside. May to July. *h.* 9in. to 15in. Allied to *A. sylvestris.*

A. Fanninii (Fannin's).* *fl.* pure white, fragrant, 3in. to 4in. in diameter; sepals twelve to thirty, linear-lanceolate, acuminate; pedicels 8in. to 10in. long or more; scape hairy, 2ft. to 5ft. high. June. *l.* sub-orbicular, 8in. to 24in. in diameter, coriaceous, five to seven-lobed, velvety above, villous beneath, the lobes toothed; petioles hairy, 1ft. to 2ft. long. South Africa. A giant Anemone. (B. M. 6958; G. C. n. s., xxv., p. 433.)

A. polyanthes (many-flowered). *fl.* white, 1in. to 2in. in diameter, in simple or compound umbels, often very numerous; sepals broadly obovate or oblong. May. *l.* 2in. to 4in. in diameter, orbicular-cordate, five to seven-lobed, but rarely below the middle; lobes coarsely and irregularly crenate; petioles very stout, 4in. to 10in. long. *h.* 1ft. to 1½ft. Himalayas. (B. M. 6840.)

A. stellata fulgens (shining). A variety differing from the type in its vermilion-scarlet flowers.

ANGRÆCUM. The species of this genus number about forty, and are nearly all natives of tropical or South Africa and the Mascarene Islands. To those described on p. 79, Vol. I., the following should now be added:

A. apiculatum (apiculate). *fl.* white, in pendulous racemes of about a dozen; spur slender, pointed, about 2in. long. *l.* distichous, obovate-lanceolate, obliquely acuminate, striated, deep green. Sierra Leone, 1844. A dwarf species, allied to *A. bilobum.* (B. M. 4159.)

A. a. Dormanianum (Dorman's). A small-flowered variety, having vermilion-flaked ovaries, and vermilion tips to the sepals. 1885.

A. articulatum (jointed). *fl.* creamy-white, racemose, polymorphous, the filiform spur as long, or sometimes three times as long, as the ovary; peduncles stout. *l.* cuneate-oblong, unequally bilobed, about 6in. long. Madagascar. A dwarf species, allied to *A. bilobum.*

A. avicularium. *fl.* snow-white; sepals and petals lanceolate, cuspidate; lip narrow at the base, oblong, cuspidate; spur filiform, 4in. to 5in. long; peduncle more than 9in. high, bearing fifteen flowers. *l.* short and broad, cuneate-oblong-elliptic, bilobed at the point, nearly 4in. long. Probably a native of tropical Africa, 1887.

A. bilobum Kirkii (Sir John Kirk's). *fl.* pure white, having slender, pale brown spurs 2½in. to 3in. long; racemes drooping. *l.* narrower than in the type, ending in two divergent lobes. Zanzibar, 1882. (W. O. A. iv. 162.)

A. calligerum (callus-bearing). *fl.* very stiff in texture; sepals ligulate, acute, with a strong, semi-oblong callus on the keel at the very base; petals cuneate-oblong, acute; lip's plate rather ligulate, pandurate, acute, with a long, filiform, acute spur, exceeding the stalked ovary six to seven lines. *l.* slightly glaucous, ligulate, bilobed. 1887.

A. crenatum (crenate). *fl.* resembling those of *A. Chailluanum* in colour and shape, but much smaller (as is also the habit of growth). June and July. West Africa. A rare and distinct species.

A. cryptodon (hidden-toothed). *fl.* white, in loose racemes; petals ligulate, acute; lip lanceolate; spur white, reddish at base, thrice as long as the reddish-white ovaries. Madagascar, 1883.

A. descendens (descending). *fl.* white, numerous in a drooping raceme. Madagascar. This differs from *A. Eilisii* in having a cuneate-ovate, acuminate lip, a shorter, hairy column, a spur more than four times as long as the pedicels, and oblong-ligulate, obscurely bilobed leaves.

A. Eichlerianum (Eichler's). *fl.* large, solitary; sepals and petals light green, lanceolate; lip white, large, obcordate, with a triangular apiculus in the notch; spur erect, conical, about as long as the sepals. *l.* distant, oblique, elliptic, obtuse. Stems tall, leafy. Loango, West Africa, 1883.

A. fastuosum (proud). *fl.* ivory-white, scented like tuberoses, numerous, racemose; sepals and petals ligulate-oblong; lip obovate; spur filiform, 2in. to 3in. long. *l.* cuneate-oblong, 3in. broad, blunt and unequally lobed at apex, wrinkled, the margins cartilaginous. Madagascar.

A. florulentum (dark-flowered). *fl.* one to three in a raceme; sepals lanceolate; petals broader than the sepals; lip oblong-lanceolate, apiculate; spur filiform, one-third longer than the ovary; racemes numerous. *l.* lanceolate, bilobed, 3in. long. Stem zigzag. Comoro Islands, 1885.

Angræcum—*continued.*

A. fuscatum (fuscous). *fl.* numerous, in a thin, lax raceme; sepals ochreous, the lateral ones reflexed; petals broader than the sepals; lip white, oblong, acuminate; spur brown, long, filiform, flexuous. *l.* cuneate-oblong, unequally bilobed. Madagascar, 1883. The habit of this plant is much in the way of *A. bilobum.* (R. G. 1234; R. H. 1887, p. 42.)

A. Grandidierianum (Grandidier's). *fl.* ivory-white, about the same size as those of *A. Chailluanum:* sepals cuneate-oblong, acute; petals spathulate, apiculate; lip cordate-pandurate or cordate-oblong, blunt, with a long, filiform spur; raceme one to three-flowered. *l.* thick, oblong, obtuse and unequally two-lobed at apex. Comoro Islands, 1887. (R. H. 1887, p. 42.) Syn. *Aëranthus Grandidierianus.*

A. Hildebrandtii (Hildebrandt's). *fl.* orange-yellow; lip oblong, acute; spur filiform, clavate, shorter than the ovary. *l.* ligulate, unequally bilobed. Comoro Isles. An elegant but small-growing plant.

A. ichneumoneum (ichneumon-like). *fl.* loosely arranged on a long axis; sepals and petals dirty ochre-white, ligulate, with a curious spur. *l.* ligulate, dark green, 1ft. long, 2in. broad, unequal at apex. 1887.

A. imbricatum (imbricated). *fl.* sweet-scented, in cluster-like racemes; sepals and petals creamy-white, lanceolate; lip orange and yellow, flabellate, retuse, apiculate, convolute, the spur recurved, blunt, not half as long as the blade of the lip, which it nearly touches. *l.* leathery, cuneate-oblong, bluntly bilobed. Stem tall, strong. 1887.

A. Leonis (Leon Humblot's). A synonym of *Aëranthus Leonis.*

A. rostellare (beaked). *fl.* resembling those of *A. fuscatum* in shape, but having a distinct, long-linear, ascending, rostellar process, and spathulate, apiculate petals; peduncles numerous, many-flowered. *l.* cuneate-oblong, bilobed at apex, unusually soft. 1885.

A. Sanderianum (Sander's). A synonym of *A. modestum.*

ANGULOA. The Peruvian and Colombian Andes are the home of these plants. To the species and varieties described on p. 79, Vol. I., the following should now be added:

A. Clowesii macrantha (large-flowered). *fl.* bright yellow, spotted red, larger than in the type. July. Colombia. A fine but scarce variety.

A. dubia (doubtful). *fl.* yellow, the sepals and petals covered on the inside with small, purple spots; lip white, blotched purple inside at base. Colombia. Supposed to be a hybrid between *A. uniflora* and *A. Clowesii.*

A. intermedia (intermediate). *fl.*, sepals and petals pale honey-coloured, densely spotted with light rosy-purple; lip almost suffused cinnamon-brown, with a few transverse purple bars on the disk. A hybrid between *A. Clowesii* and *A. Ruckeri.* 1888.

A. media (intermediate). *fl.*, sepals and petals orange-yellow outside, brownish-purple internally, the lateral sepals being marked with a central, orange line; side lobes of the lip reddish-brown, the disk ochre, the anterior lobe short. A garden hybrid, probably between *A. Clowesii* and *A. Ruckeri.*

A. Ruckeri retusa (retuse). *fl.* yellowish outside, spotted dark purple within; lateral lobes of the lip rectangular, the middle lobe small, reflexed, hairy. 1883. A remarkable variety.

A. Turneri (Turner's). *fl.* pink, the sepals and petals densely spotted inside with bright rose-colour. May and June. Colombia. A beautiful plant.

A. virginalis (virgin-white). *fl.* white, spotted dark brown. June and July. Pseudo-bulbs dark green. *h.* about 1ft. Colombia.

ANISANTHERA (of Rafinesque). A synonym of **Caccinia** (which *see*).

ANŒCTOCHILUS. According to the authors of the "Genera Plantarum," there are only about eight distinct species, natives of the East Indies and the Malayan Archipelago. To the species and varieties described on pp. 81-2, Vol. I., the following should now be added:

A. Boylei (Boyle's). *l.* ovate, acuminate, 2in. long and broad, olive-green, netted and pencilled over the entire surface with gold. India.

A. concinnus (neat). *l.* ovate, acuminate, rounded at base, dark olive-green, striped and netted with shining coppery-red. Assam.

A. Dominii (Dominy's). *l.* dark olive-green, the centre marked by a pale coppery-yellow streak, and the main ribs by pale lines. A vigorous garden hybrid between *Goodyera discolor* and *Anœctochilus xanthophyllus.*

A. Eldorado (Eldorado). *l.* dark green, with small tracery of a lighter colour, deciduous. Central America. This species is difficult to cultivate; it must never be allowed to get dry at the roots, even when the leaves have died down.

Anœctochilus—*continued.*

A. Friderici-Augusti (Frederick Augustus'). This is identical with *A. xanthophyllus.*

A. Heriotii (Heriot's). *l.* 3½in. long, 2½in. broad, dark mahogany-colour, with golden reticulations, a shadow of network showing through the surface. India.

A. hieroglyphicus (hieroglyph-marked). *l.* ovate-elliptic, small, dark green, marked with silvery-grey blotches of hieroglyphic character. Assam.

A. javanicus (Java). A synonym of *Argyrorchis javanica.*

A. Lansbergiæ (Mme. van Lansberge's). *l.* larger than those of *Dossinia marmorata;* groundwork of upper surface dull velvety-maroon, median nerve and smaller veins emerald, lines near margin dull gold; under surface light salmon-colour. A vigorous species. (I. H. ser. v. 1.)

A. latimaculatus (broadly spotted). *l.* dark green, with silvery markings. Borneo.

A. Lobbianum (Lobb's). A synonym of *A. Roxburghii.*

A. Lobbii (Lobb's). A synonym of *A. argyroneura.*

A. Nevillianus (Neville's). *l.* oblong-ovate, 1½in. long, of a rich, dark velvety, coppery or bronzy hue, marked with two rows of pale, oblong blotches. *h.* 3in. Borneo.

A. Petola (Petola). A synonym of *Macodes Petola.*

A. querceticola (Oakwood-dwelling). A synonym of *Physurus querceticolus.*

A. regalis (royal). The correct name of *A. setaceus.*

A. Reinwardtii (Reinwardt's). *l.* deep velvety-bronze, intersected with bright golden lines. Java, 1861. A handsome species, somewhat resembling *A. regalis.* (B. H. 1861, 18.)

A. Veitchii (Veitch's). This is identical with *Macodes Petola.*

ANSELLIA. This genus consists of only three or four species, broadly dispersed through tropical Africa, one extending as far as Natal. To the species and varieties described on p. 83, Vol. I., the following should now be added:

A. africana (African), of Lindley. A synonym of *A. confusa.*

A. confusa (confused). This differs from *A. africana* in having the petals scarcely broader than the sepals. Western tropical Africa. (B. R. 1846, 30, under name of *A. africana.*)

A. congoensis (Congo). *fl.* produced in racemes, with erect, not spreading, pedicels; sepals and petals light greenish-yellow, with dark purplish-brown spots; side lobes of the lip whitish, veined purple, the narrow front lobe yellow, the two keels on the disk almost vanishing before reaching the middle of the front lobe. Congo, 1886. A handsome plant, similar to *A. africana,* but more floriferous.

ANTHERICUM. About fifty species are comprised in this genus; they are natives of Europe, tropical and extra-tropical Africa, and America. To those described on pp. 83-4, Vol. I., the following should now be added:

A. echeandioides (Echeandia-like). *fl.* arranged in pairs in a simple, loose raceme less than 1ft. long; perianth ¾in. long, the segments orange-yellow, with a keel of three greenish ribs; peduncle simple, terete, above 1ft. long. November. *l.,* produced ones five or six, confined to the base of the stem, lanceolate, about 1ft. long, bright green, membranous, channelled. Mexico (?), 1883. Greenhouse. (B. M. 6809.)

A. variegatum (variegated). A synonym of *Chlorophytum elatum variegatum.*

ANTHRISCUS (a name given by Pliny to a plant resembling Scandix). ORD. *Umbelliferæ.* A genus of about ten species of hardy or half-hardy, annual, biennial, or rarely perennial herbs, with the habit of *Chærophyllum,* inhabiting North temperate and sub-tropical regions. Flowers white, in compound umbels; involucral bracts one, two, or wanting. Leaves pinnately or sub-ternately decompound. Only one species calls for mention. For culture, *see* **Chervil, Common or Garden,** pp. 313-4, Vol. I.

A. cerefolium (waxy-leaved). Common Chervil. *fl.* slightly radiant; umbels axillary or opposite the leaves, sessile. June. *l.* twice pinnate, cut, with channelled footstalks. Stem a little hairy at the joints. *h.* 1½ft. Europe (frequently met with as an escape from cultivation in Britain). Annual. SYN. *Chærophyllum sativum* (Sy. En. B. 623).

ANTHURIUM. This genus embraces about 160 species, all tropical American, and there are now a large number of beautiful hybrids in cultivation. To those described on pp. 85-7, Vol. I., the following should now be added:

A. acutum (acute-leaved). *fl.,* spathe reflexed, 2¼in. long; spadix dark green, 2⅜in. to 3in. long. *l.* spreading, 8in. to 10in. long, 3½in. to 4in. broad across the tips of the hind lobes, triangular-hastate,

Anthurium—*continued.*

gradually tapering to an exceedingly acuminate point; petioles 10in. to 12in. long, slender. Brazil, 1887.

A. album maximum flavescens (white, largest, yellowish). A synonym of *A. Scherzerianum lacteum.*

A. Andreanum flore-albo (white-flowered). A white-spathed form.

A. A. grandiflorum (large-flowered). *fl.,* spathe 8½in. long; spadix 4in. long. 1886. (I. H. 1886, 599.)

A. A. roseum (rosy). A synonym of *A. cruentum.*

A. Archiduc Joseph. *fl.,* spathe of a beautiful, clear scarlet, broadly cordate, 4in. to 5in. long, 3½in. to 4in. broad; spadix flesh-colour, with whitish, exserted styles. *l.* cordate-ovate, rather abruptly acuminate at apex, deeply cordate at base; petioles terete, elongated. 1885. A hybrid between *A. Andreanum* and *A. Lindeni.*

A. brevilobum (short-lobed). *fl.,* spathe purplish, 2in. long, ½in. broad, narrow-lanceolate, acuminate; spadix dark purplish-brown, 3in. to 4in. long, ⅛in. thick; peduncle brownish-purple, 1ft. to 1½ft. long, terete. *l.* 8in. to 10in. long, 4in. to 4¾in. broad, parchment-like in texture, cordate-ovate, acuminate, bright, shining green above, paler beneath, the lobes short; petioles 1ft. to 1½ft. long, terete, channelled. Stem elongating, rooting. Native country unknown. 1887.

A. carneum (flesh-coloured). *fl.,* spathe light rose-colour, cordate-ovate, with longitudinal depressions; spadix rose-colour, with a whitish glaze; peduncle terete, rather longer than the petioles. *l.* green, shortly cordate, cuspidate; petioles short, terete. 1884. A garden hybrid between *A. ornatum* and *A. Andreanum.*

A. Chantrieri (Chantrier's).* *fl.,* spathe ivory-white, erect, oblong, acuminate; spadix dark violet; peduncle green, terete, shorter than the petioles. *l.* triangular or rhomboid, acuminate, with widely spreading basal lobes, dark shining green; petioles olive-green, terete. 1884. A vigorous hybrid between *A. subsignatum* and *A. ornatum.*

A. chelseiense (Chelsea). *fl.,* spathe rich crimson, smooth and glossy, broadly cordate, cuspidate at apex, 3½in. to 5in. long, 2⅜in. to 3½in. broad; spadix at first yellowish at the apex, the basal part white. *l.* resembling those of *A. Veitchii,* but more ovate in form, and having fewer and less arched veins. 1885. A garden hybrid between *A. Veitchii* and *A. Andreanum.*

A. crassifolium (thick-leaved). *fl.,* spathe light green, reflexed; spadix dull green, sessile, 2in. long; peduncle green, terete, as long as the petioles. *l.* ovate-lanceolate, very thick and stiff, with a very short, rigid mucro at the obtuse apex; petioles long. 1883.

A. cruentum (bloody). A garden hybrid, of the same origin as *A. mortfontanense,* and resembling that plant, but having blood-red spathes. 1886. SYN. *A. Andreanum roseum.*

A. dentatum (toothed). *l.* large, cordate, deeply lobed, bright green, with paler nerves, the old ones sometimes shaded with dark glaucous reflections, the lobes ovate, acute; young leaves cordate, entire. 1884. A garden hybrid between *A. fissum* and *A. leuconeurum.* (R. H. 1884, p. 293.)

A. Devansayanum (Devansay's). *fl.,* spathe and spadix erect, the latter stipitate. *l.* cordate, wavy, acuminate, erect; petioles terete. 1883. Garden hybrid. (R. H. 1882, p. 289.)

A. Eduardi (Eduard's). *l.* somewhat triangular-ovate, having a very open sinus and rounded basal lobes, dark green, with a violaceous lustre; petioles short, firm, terete. 1884. A garden hybrid between *A. crystallinum* and *A. subsignatum.*

A. elegans (elegant). *fl.,* spathe green, broadly lanceolate, 3¼in. to 3½in. long; spadix dark purple or green. *l.* cordate-ovate in outline, pedately radiate, with nine to thirteen very unequal segments, the intermediate one nearly twice the size of the lateral ones; petioles more than twice the length of the blade. Columbia, 1883. (R. G. 1112.)

A. flavidum (yellowish). *fl.,* spathe pale yellowish or yellowish-green, spreading, oblong, abruptly cuspidate; spadix pale violet-pink, 1⅜in. to 3in. long, sessile; peduncle 5in. to 6in. long. *l.* cordate-ovate, acuminate, 10in. to 14in. long. Columbia, 1885.

A. Fœbelii (Fœbel's). *fl.,* spathe bright, deep carmine, large, with depressions as in *A. Andreanum. l.* large, cordate. 1886. A fine, free-flowering hybrid between *A. Andreanum* and *A. ornatum.*

A. Glaziovii (Glaziou's). *fl.,* spathe dirty green outside, dull vinous-purple within, horizontally spreading, 7in. long, 1in. broad; spadix vinous-purple, spotted with the black stigmas, erect, shortly stipitate, 8in. long. June. *l.* four or five, sub-erect, dark, shining green, narrowly oblong-obovate or oblong-oblanceolate, obtuse or sub-acute, coriaceous, flat, strongly nerved. Rio de Janeiro (?), 1880. (B. M. 6833.)

A. Gustavi (Gustav's). *fl.,* spathe green, erect, narrow-lanceolate, shorter than the spadix; spadix cylindrical, sessile, obtuse, about 5in. long; peduncle much shorter than the petioles. *l.* roundish-cordate or cordate-ovate, sub-obtuse, 2½ft. long, 1⅜ft. to 2ft. broad, deeply nerved; petioles sub-terete, 2ft. long. Caudex very short, erect. Buonaventura, 1883. (R. G. 1076.)

Anthurium—*continued.*

A. Houlletianum (Houllet's). *fl.*, spathe pale rose-coloured, cordate-ovate, acute; spadix olive-green, passing into yellow; peduncle much longer than the leaves, terete. *l.* cordate-oblong, dark, shining green, with satiny or metallic reflections; petioles short, cylindric. 1884. A garden hybrid between *A. magnificum* and *A. Andreanum*.

A. hybridum (hybrid). *l.* broad, bluntly hastate, green, on brown, terete petioles. 1874. A distinct plant.

A. inconspicuum (inconspicuous). *fl.*, spathe bright green, ¾in. to 1in. long, ¾in. broad, reflexed; spadix dark violet-brown, ½in. to 1in. long; scape 6in. to 9in. long. *l.* 9in. to 12in. long, 1½in. to 3in. broad, narrowly elongate-elliptic, narrowed to both ends; petioles 6in. to 9in. long. Stem (probably) elongating. Brazil, 1885.

A. insigne (remarkable). The correct name of the plant described on p. 97, Vol. III. as *Philodendron Holtonianum*.

A. intermedium (intermediate). *l.* deflexed, cordate, oblong-ovate, velvety green, with a slight orange tinge, the midrib and veins whitish. 1884. A garden hybrid between *A. hybridum* and *A. crystallinum*.

A. leodiense. *See* **A. mortfontanense.**

A. magnificum (magnificent). *fl.*, spathe green, short, oblong, recurved; spadix green, cylindrical; scape terete, rather shorter than the petioles. *l.* deeply cordate-ovate, abruptly acuminate, with large, rounded basilar lobes; petioles tetragonal; stipules ovate-oblong. Cundinamarca. (R. G. 508.)

A. Mooreanum (Moore's). *fl.*, spathe purplish-green, 4in. to 4½in. long, linear-oblong, acuminate; spadix olive-brown, 5in. to 6in. long, slightly tapering; peduncle as long as the petioles. *l.* sub-hastate, 1ft. long, on petioles 1½ft. long. 1886. A hybrid between *A. crystallinum* and *A. subsignatum*, of no remarkable beauty.

A. mortfontanense (Mortefontaine).* *fl.*, spathe crimson, large, cordate; spadix whitish. *l.* elongated, cordate-ovate. 1885. An ornamental hybrid between *A. Andreanum* and *A. Veitchii*. (R. H. 1885, pp. 50, 156.) *A. leodiense* is very similar to this.

A. punctatum (dotted). *fl.*, spathe reddish above, green beneath, changing to greyish-green or purplish-green, spreading or reflexed, 3½in. to 4½in. long, linear-oblong, cuspidate-acuminate, the margins revolute; spadix olive-green, 6in. to 9in. long, slightly tapering; peduncle 1ft. to 1½ft. long. *l.* 14in. to 20in. long, 2¾in. to 4½in. broad, elongate-oblong, rather abruptly acute, cuneate at base, dark green above, paler and blackish-dotted beneath; petioles 6in. to 8in. long, acutely channelled down the face. Ecuador, 1886.

A. purpureum (purple). *fl.*, spathe purple on both sides, suffused green at the base, 4½in. long, 1in. broad, spreading or reflexed, more or less curled; spadix dark violet-purple, 6in. or more long, ⅓in. thick. *l.* coriaceous, green, 1½ft. long, 3¾in. broad, oblong-lanceolate, acute at apex, cuneate-acute at base; petioles 3in. to 6in. long, shallowly channelled. Stem ascending. Brazil, 1887.

A. Scherzerianum andegavense (Angers). *fl.*, spathe scarlet on the back, dotted with white, white within, splashed with scarlet; spadix yellow. 1883. A handsome form, resembling *Rothschildianum*. (F. d. S. 2454-5.)

A. S. bruxellense (Brussels). *fl.*, spathe and scape rich scarlet; spadix orange. *l.* lanceolate, tapering to the apex. 1887. (I. H. ser. v. 18.)

A. S. giganteum (gigantic). *fl.*, spathe 5in. to 6in. long, and in some cases 4in. across. Costa Rica. A brilliant variety.

A. S. lacteum (milk-white). *fl.*, spathe milk-white; spadix orange. 1885. (I. H. 1886, 607, under name of *A. album maximum flavescens*.)

A. S. mutabilis (changeable). *fl.*, spathe at first white, gradually becoming scarlet. 1882.

A. S. parisiense (Parisian). *fl.*, spathe of a beautiful salmon-pink; spadix brilliant orange. *l.* deep green, lanceolate, gradually tapering to the acute apex. 1887. A robust, compact plant. (I. H. ser. v. 16.)

A. S. Vervaeneum (Vervaenc's). A handsome, white-spathed variety. 1884. (R. H. 1884, p. 204.)

A. S. Woodbridgei (Woodbridge's). *fl.*, spathe of the most intense crimson-scarlet, broad, nearly 6in. long. *l.* dark green, spreading. 1882. One of the finest forms.

A. subulatum (subulate). *fl.*, spathe white, spreading, oblong, ending in a long, subulate point; spadix purplish-red, stout; peduncle 9in. to 12in. long. *l.* dark green, elongated, cordate-ovate, cuspidate-acuminate at apex. Caudex short. Columbia, 1886. A distinct and rather ornamental species.

A. trifidum (thrice-cleft). *fl.*, spadix shortly stipitate, slender, terete; spathe reddish, reflexed, oblong-lanceolate; peduncle erect, red or reddish-brown, shorter than the petioles. *l.* 10in. to 15in. long, broadly and deeply trifid; lateral lobes obliquely oblong-ovate, obtuse, somewhat falciform, shorter than the median lobe; petioles elongated. Origin uncertain. 1876. (B. M. 6339.)

A. Veitchii acuminatum (acuminate-leaved). A variety having ovate-lanceolate, acuminate leaves. Columbia, 1885

APHELANDRA. Of this genus nearly fifty species have been noted; they inhabit tropical and sub-tropical America, from the Argentine Republic as far as Mexico. To those described on pp. 90-1, Vol. I., the following should now be added:

A. amœna (pleasing). *l.* ovate, acuminate, deep green, variegated silvery-grey on each side the midrib and primary veins, which latter curve in the direction of the apex. Brazil, 1888.

A. atrovirens (dark green). *fl.* in a terminal, sessile, sub-cylindrical spike; corolla fulvous-yellow, nearly 1in. long; bracts green, six to seven lines long, closely appressed. *l.* 3½in. to 4½in. long, 1¾in. to 2½in. broad, elliptic or elliptic-ovate, rather obtuse, decurrent at base, crenate, very dark green and shining above, violet-purple beneath. Bahia, 1884. Plant dwarf. (I. H. 1884, 527.)

A. Chamissoniana (Chamisso's). This is the correct name of the plant described on p. 91, Vol. I., as *A. punctata*. (B. M. 6627.)

A. Macedoiana (Macedo Costa's). *l.* elliptic-ovate, sub-obtuse, dark green above, the nerves margined with very pale whitish-green, the under surface violet-purple. 1886. (I. H. 1886, 583.)

A. Margaritæ (Mdlle. Marguerite Closon's).* *fl.* bright orange or apricot-colour, growing in short, terminal spikes from between pectinate bracts. *l.* decussate, shortly stalked, elliptic, the upper surface marked with about half-a-dozen oblique bars of white on each side the midrib, the under surface clear rose-colour. Central America (?), 1884. (B. H. 1883, 19; G. C. ser. iii., vol. ii., p. 585.)

A. pumila splendens (splendid). This pretty form differs from the type in having acute, green bracts. 1883. (R. G. 1104.)

APONOGETON. This genus comprises about a score species of stove, greenhouse, or half-hardy, scapigerous, submerged, aquatic herbs, inhabiting tropical and temperate Asia and Africa, and Australia. Flowers white, or rarely pink or violet, hermaphrodite, spicate; perianth segments (or bracts) two or three, rarely one or wanting, petaloid; spikes solitary or twin, sessile at the apex of the scape. Leaves long-petiolate, oblong or linear, erect or swimming. To the species described on p. 93, Vol. I., the following variety should now be added:

A. distachyon roseus (rosy). A charming variety, having rosy-tinted flowers. 1885.

AQUILEGIA. According to Bentham and Hooker, the numerous species may be reduced to about five or six; they are distributed over the North temperate zone, the genus being represented in Britain by *A. vulgaris*. To the species and varieties described on pp. 100-2, Vol. I., the following should now be added:

A. flabellata (fan-shaped). *fl.* white, slightly tinted with violet-rose. A very early-flowering, compact-habited, dwarf, garden form. (R. H. 1887, p. 548.)

A. olympica flore-pleno (double-flowered). *fl.* blue, with a white centre, very large. 1888.

A. Skinneri (Skinner's). *fl.* drooping; petals with the limb yellowish-green and rounded, prolonged at base into a very long, tubular, lively red spur. Summer and autumn. *l.* mostly radical, glaucous, on long petioles, biternate; leaflets petiolulate and cordate, deeply three-lobed. Stem 2ft. to 3ft. high, panicled above. Guatemala. (B. M. 3919.) The variety *flore-pleno* (R. G. 1885, p. 57) has double flowers.

ARACHNANTHE (from *arachne*, a spider, and *anthe*, a flower; in allusion to the shape of the flower). Syn. *Arachnis*. Including *Esmeralda*. Ord. *Orchideæ*. A genus comprising about half-a-dozen species of stove, epiphytal Orchids; one is Himalayan, and the rest inhabit the Malayan Archipelago. Flowers showy; sepals and petals free, spreading, rather thick; lip articulated at the base of the column, erect or spreading, neither saccate nor spurred at base, the lateral lobes erect or rarely obsolete, the middle one fleshy, polymorphous, often gibbous or with a very short spur at back; column short, thick; pollen masses two; peduncles lateral, elongated, simple or branched. Leaves distichous, fleshy-coriaceous, sometimes very long, sometimes shorter or falcate, often obliquely bilobed at apex. Four species call for mention here. For culture, *see* **Aërides**, p. 31, Vol. I.

A. bella (pretty). *fl.*, sepals and petals light ochre, barred cinnamon, straight, cuneate-oblong; lip white, the lateral segments striped purplish-brown, the middle one very broad, tumid, the basilar, roundish callus white, spotted brown; raceme four-flowered. *l.* 5in. long, 1in. broad, unequally bilobed at apex. 1888. Syn. *Esmeralda bella*.

Arachnanthe—*continued.*

A. Cathcarti (Cathcart's). The correct name of the plant described on p. 133 as *Vanda Cathcarti.*

A. Lowii (Low's). The correct name of the plant described on p. 283, Vol. III., as *Renanthera Lowii.*

A. moschifera (musk-bearing). *fl.* creamy-white or lemon-colour, spotted purple, large, resembling a spider, delicately scented like musk. Java. A peculiar and rare plant. The old spike produces flowers for a long time, and should, therefore, not be cut. SYNS. *Epidendrum Flos-aëris, Renanthera Arachnites, R. Flos-aëris.*

ARACHNIS. A synonym of **Arachnanthe** (which *see*).

ARALIA. Of the thirty species comprised in this genus, six are North American, one is Mexican, and the rest inhabit Eastern or tropical Asia, from Japan and Mandschuria as far as the Himalayas and the Indian Archipelago. The plant usually grown as *Aralia Sieboldii* is *Fatsia japonica.* To the species and varieties described on pp. 104-5, Vol. I., the following should now be added:

A. Chabrieri (Chabrier's), of gardens. A synonym of *Elæodendron orientale.*

A. Gemma (jewel). *l.* graceful, bipinnate; pinnules with small lateral leaflets and a large terminal one, all irregularly lobed or toothed, olive-green above, greyish-violet beneath when young. New Caledonia, 1883. An ornamental, stove shrub. (I. H. 1883, 477.)

A. reginæ (queenly). This is of larger habit than the *Veitchii* section; the leaf branches are more closely set, and the habit of growth is very graceful: the stem and petioles are freckled; the palmate divisions of the stalk are smooth, and of a uniform green. Stove.

ARAUCARIA. The known species of this genus number about ten, and inhabit South America, Australia, New Caledonia, and the South Pacific Islands. To those described on p. 106, Vol. I., the following should now be added:

A. Mulleri (Müller's). *l.* oval, imbricated, almost flat, longitudinally marked with small, whitish spots arranged in series. *cones* ovoid, 5½in. long, 3½in. broad; scales about 1⅝in. long and broad. New Caledonia, 1884. Plant ultimately forming a large tree, with spreading, plume-like branches. (F. & P. 1884, p. 27; I. H. ser. iv. 449.)

ARAUJA. The correct name of the genus described on pp. 115-6, Vol. III., as *Physianthus.* To the species there given the following should now be added:

A. grandiflora (large-flowered).* *fl.* pure white, very sweet-scented, funnel-shaped, nearly 3in. across, borne in clusters of about six. September. *l.* cordate-obovate, acute. Brazil, 1837. SYN. *Schubertia grandiflora* (Gn., 30th July, 1887.)

ARCTOTIS. This genus embraces thirty species, natives of South Africa, with one Abyssinian. Leaves radical or alternate. To the species described on p. 108, Vol. I., the following should now be added:

A. Leichtliniana (Leichtlin's). *fl.-heads* 2½in. in diameter; ray florets golden-yellow, with a dark basal mark, below flaked with red, 1¼in. long. Summer. *l.* 2in. to 8in. long, obovate or oblanceolate, petiolate, pinnatifid and toothed; lobes oblong, slightly lobulate. 1885.

A. revoluta (revolute). *fl.-heads* orange-yellow, not so brilliant as those of *A. grandiflora*, 2½in. across; outer involucral scales much narrower than in *A. grandiflora*, and having tomentose tips. Cape of Good Hope, 1885. (B. M. 6835, lower figure.)

ARDISIA. Of this genus there are about 200 species, broadly dispersed through tropical and sub-tropical regions, but very rare in tropical Africa. To those described on p. 109, Vol. I., the following should now be added:

A. capitata (headed). *fl.* greenish-white, disposed in a cone-like head; peduncles axillary, compressed. Summer. *fr.* bright red. *l.* crowded at the tips of the branches, 1ft. or more long, obovate-spathulate, entire, shortly stalked. Branches thick. Fiji, 1887.

A. mamillata (nippled). *fl.* white, tinged rose, star-shaped; umbels ten to twelve-flowered, on axillary peduncles 2in. long. *fr.* brilliant rosy-red, about ⅜in. in diameter. *l.* oblong-elliptic, 4in. or more long, dark, shining green, thickly studded with small, raised dots or mamillæ on the upper surface, with proportionate hollows beneath, each mamilla surmounted by a white, bristly hair; petioles short. Hong Kong, 1887. (G. C. ser. iii., vol. ii., p. 809.)

A. picta (painted). *l.* lanceolate, acute, crenate at the margins, dark, velvety bronze-green, with a broad, central, feathered, silvery stripe. Brazil, 1885. An ornamental, stove, foliage plant.

Ardisia *—continued*

A. polycephala (many-headed). *fl.* white, borne in umbels, on short, lateral branches. *fr.* jet-black. *l.* opposite, dark, glossy green, when young bright crimson. East Indies, 1888.

ARENARIA. The species of this genus are distributed over the whole globe. To those described on p. 110, Vol. I., the following should now be added:

A. norvegica (Norwegian). *fl.* white, terminal, somewhat globose; sepals ovate, obtuse, equalling the corolla. June and July. *l.* spathulate, glabrous. Stems terete, procumbent, one or two-flowered. Norway, Lapland, &c. (Shetland). (F. D. 1259; Sy. En. B. 237.)

ARGEMONE HISPIDA. The correct name of the plant described on p. 110, Vol. I., as *A. hirsuta.*

ARGYRORCHIS (from *argyros*, silver, and *Orchis*; alluding to the silvery network of the leaves). ORD. *Orchideæ.* A monotypic genus. The species is a stove, terrestrial Orchid, allied to **Anœctochilus** (which *see*, on p. 81, Vol. I., for culture).

A. javanica (Java). *fl.* pink, small, disposed in loose, sessile spikes; scape 9in. high. *l.* petiolate, broadly ovate 2in. long, 1½in. broad, dark, velvety olive-green, blotched lighter green, and showing faint golden reticulations, pinkish beneath. Java. (B. H. 1861, 18, under name of *Anœctochilus javanicus.*)

ARISÆMA. The fifty species of this genus are mostly natives of temperate and sub-tropical Asia, a few being North American and one Abyssinian. To those described on pp. 111-2, Vol. I., the following should now be added:

A. fimbriatum (fringed).* *fl.*, spadix cylindrical, slender, the free end covered with slender, purplish threads; spathe brownish-purple, longitudinally banded whitish, oblong, acute or acuminate, convolute at base. *l.* two, deeply divided into three ovate, acute, glabrous segments; petioles long, pale purplish-rose, spotted purple. Philippine Islands, 1884. See Fig. 3, for which we are indebted to Mr. William Bull. (G. C. n. s., xxii., p. 689; R. G. 1886, 357.)

A. utile (useful). *fl.*, spadix purple; spathe reddish-brown, with greenish ribs and veins, the tube 3in. to 4in. long, the lamina decurved, rarely sub-erect, 3in. to 4in. across. May and June. *l.* in pairs; leaflets three, shortly and stoutly petiolulate or sessile, the middle one broader than long, 5in. to 8in. in diameter. Sikkim Himalayas, 1880. (B. M. 6474.)

ARISARUM. Only three species compose this genus, which is confined to the Mediterranean region. To that described on p. 112, Vol. I., the following should now be added:

A. proboscideum (proboscis-like). *fl.*, spathe erect, greyish-white and inflated below, the upper part olive-green, narrowed into a proboscis which is often 5in. long; spadix included. February. *l.* solitary or few, 3in. to 4in. long, 1in. to 2in. broad, hastate; petioles 4in. to 6in. high, stout, cylindric. Upper Arno and the Apennines. (B. M. 6634.)

ARISTEA. This genus embraces about fifteen species, natives of tropical and South Africa and Madagascar. To those mentioned on p. 112, Vol. I., the following should now be added:

A. platycaulis (broad-stemmed). *fl.*, perianth blue, the segments oblong, ½in. long; pedicels small; inflorescence an ample panicle 8in. to 9in. long, with all the rachises much flattened, the lower branches overtopped by their subtending leaves. Summer. *l.*, radical ones ensiform, firm, 1ft. long, 1in. broad. 1887.

ARISTOLOCHIA. About 180 species are included here, and they are broadly dispersed over the temperate and warmer regions. To those described on pp. 112-3, Vol. I., the following should now be added:

A. altissima (very tall). *fl.* pale yellowish-brown, striped reddish-brown; perianth about 1½in. long, the tube gradually enlarged to the limb, which is yellow within. June to August. *l.* bright, glossy green, petiolate, 2in. to 3in. long, ovate-cordate, obtuse or acute, waved; petioles ½in. to ¾in. long. Sicily and Algeria. Half-hardy. (B. M. 6586.)

A. elegans (elegant).* *fl.* solitary, on long pedicels; perianth tube pale yellowish-green, 1½in. long, rather inflated, the limb suddenly expanding into a nearly shallow cup, which externally is white, veined purple, and internally rich purplish-brown, with irregular, white marks. August. *l.* 2in. to 3in. long and broad, broadly reniform-cordate; petioles 1in. to 2½in. long, very slender. Brazil, 1883. Stove climber. (B. M. 6909.)

A. hians (gaping). *fl.* bronzy-green outside, the veins and margin of the beak light yellowish-green, the inside of the broad lobe dull yellowish-green, marked purple-brown, the inside of the beak

Aristolochia—*continued.*

covered with brownish-purple hairs, the inside of the inflated tube pale greenish, hairy, spotted purple-brown in the upper half. September. *l.* roundish in outline, deeply cordate at base, obtusely rounded at apex, green, reticulated beneath; stipules 1in. in diameter, with wavy margins. Venezuela, 1887. Stove.

Aristolochia—*continued.*

A. longifolia (long-leaved). *fl.* purplish-brown, of a good size; tube yellowish, with dull purplish veins outside, abruptly bent upon itself; limb roundish, about 2½in. in diameter, the lower part bent as if pinched in the middle. *l.* long, linear-lanceolate, acuminate. Stems long, climbing. Rootstock short, woody. Hong Kong, 1886. Stove. (B. M. 6884.)

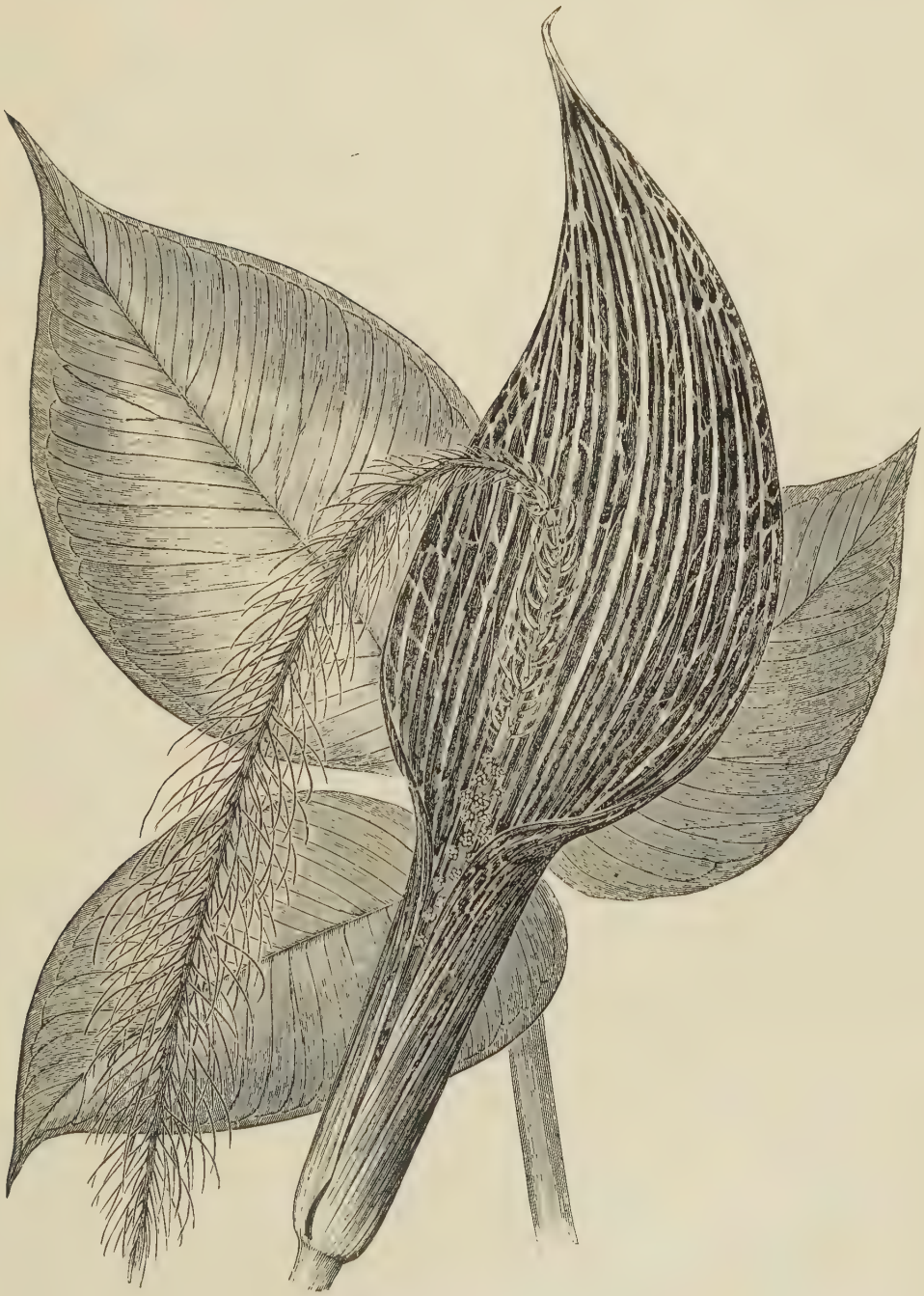

FIG. 5. INFLORESCENCE AND LEAF OF ARISÆMA FIMBRIATUM.

Aristolochia—*continued.*

A. ridicula (ridiculous). *fl.* 3½in. to 4½in. long; tube dull whitish, veined purplish-brown, bent upon itself, the basal part inflated; limb shortly revolute, prolonged from the upper part of the sides into two long lobes, "reminding one of a donkey's ears"; they are tawny or cream, with dark purplish-brown, dendritic markings, sparsely purple-brown hairy. *l.* bright green, orbicular or orbicular-reniform, cordate at base, covered with short hairs. Stem, petioles, and pedicels clothed with spreading hairs. Brazil, 1886. Stove climber. (G. C. n. s., xxvi., p. 361.)

A. salpinx (trumpet). *fl.* about 1½in. long, inflated at base, then abruptly constricted and bent upwards in the form of a dorsally compressed, trumpet-shaped tube, with an oblique mouth, outside cream-coloured, with purple network of veins, inside lighter, the upper lip with a yellow central blotch and numerous purplish spots around it, the margins slightly reflexed, marked with purple lines and having a few short, purple hairs. *l.* cordate-ovate, acuminate, glabrous, 4in. to 6in. long, 2½in. to 3in. broad. Paraguay, 1886. Stove. (G. C. n. s., xxvi., pp. 456-7.)

A. Westlandi (A. B. Westland's). *fl.* pendulous, chiefly produced from towards the base of the plant; perianth tube brown and yellow, cylindric, the limb pale greenish-yellow, veined and speckled purple, 6in. long, broadly rounded-ovate; peduncle 3in. to 5in. long, one-flowered. March. *l.* 6in. to 10in. long, shortly petiolate, narrowly oblong-lanceolate, acuminate, glabrous above, strongly nerved and pubescent beneath. Stem short, woody; branches tall-climbing. China, 1886. Stove. (B. M. 7011.)

ARMERIA. According to some authors, the number of species of this genus is upwards of fifty: while others reduce the number to six or seven. The genus is mostly represented in Europe, North Africa, and Western Asia. To the species described on pp. 113-4, Vol. I., the following should now be added:

A. cæspitosa (tufted). *fl.* pale lilac, in small heads; involucral leaflets brownish; scape pubescent. Summer. *l.* very short, narrow-linear, triquetrous, rigid, recurved. *h.* 1in. to 2in. Mountains of Spain, 1885. The smallest of the Thrifts. (R. G. 1192, f. 2.)

ARUNDINA (a diminutive of *Arundo;* in allusion to the Reed-like stems). ORD. *Orchideæ.* A small genus (about five species) of erect, terrestrial, leafy Orchids, natives of the East Indies, South China, and the Malayan Archipelago. Flowers rather large, in terminal, loose, simple or rarely divided racemes; sepals sub-equal, free, spreading; petals similar or broader; lip erect at the base of the rather long, erect column, which is surrounded by the lateral lobes. Leaves flat, narrow or rather broad, sessile, with articulated sheaths. Stems erect, Reed-like, invested with the leaf-sheaths. Pseudo-bulbs wanting. The two species introduced should be grown in a cool part of the East Indian house. Rough, fibrous peat and loam form the best compost, as the plants are devoid of pseudo-bulbs, and require richer soil than many other Orchids. Copious supplies of water and plenty of light, but shading in hot sunshine, are essential to success in the culture of Arundinas. Propagation may be effected by divisions, or by potting the young plants that are produced on the stems.

A. bambusæfolia (Bamboo-leaved). *fl.* large; sepals and petals pale magenta-rose; lip rose, striped orange on either side the white throat. July to autumn. *l.* pale green, ensiform. Stems 3ft. to 5ft. high. Nepaul, Birma, &c. (W. O. A. iii. 139.) SYN. *Bletia graminifolia.*

A. densa (dense). *fl.* rosy-violet, as large as those of *B. bambusæfolia*, scented, the lip bordered crimson; raceme close, head-like. *l.* lanceolate, sub-equal, sheathing. Stems 3ft. high. Singapore, 1842. (B. R. 1842, 38.)

ASAGRÆA. A synonym of **Schœnocaulon** (which *see*).

ASPARAGUS. This genus comprises nearly 100 species, broadly dispersed over the temperate and warmer regions. To those described on pp. 122-3, Vol. I., the following should now be added:

A. tenuissimus (very slender). A semi-scandent plant of a strikingly elegant character, adapted for the warm conservatory. It is of a lighter green than *A. plumosus*, and the foliage is remarkable for its extreme slenderness and delicate appearance. South Africa, 1882.

ASPASIA. The half-dozen species of this genus are all tropical American, ranging from Brazil as far as

Aspasia—*continued.*

Central America. To those described on p. 124, Vol. I., the following should now be added:

A. principissa (princely). *fl.* over 2in. across, somewhat resembling those of an Odontoglossum; segments light green, lined brown, lanceolate-linear; lip light buff, broadly pandurate, almost 1in. long. Veraguas.

ASPHODELUS. The six or seven species of this genus are reduced by Baker to five; they inhabit the Mediterranean region, one extending as far as India and the Mascarene Islands. To those described on p. 125, Vol. I., the following should now be added:

A. acaulis (stemless). *fl.* six to twenty in a lax corymb; perianth pale pink, 1in. to 1½in. long, funnel-shaped; peduncle very short or abortive. May. *l.* ten to twenty in a dense, radical rosette, linear, tapering to a point, 6in. to 12in. long, minutely pubescent. Algeria. (B. M. 7004.)

A. comosus (tufted). *fl.*, perianth ⅝in. long, the segments white, with a green keel; panicle 1ft. long, with a dense terminal raceme 2in. in diameter, and six or eight small side ones; peduncle stout, as long as the leaves. *l.*, radical ones ensiform, 1½ft. long, gradually tapering, acutely keeled at back. North-western Himalayas, 1887.

ASPIDIUM. This cosmopolitan genus embraces about sixty species. To the information given on pp. 125-7, Vol. I., the following should now be added:

A. cristatum (crested). A synonym of *Nephrodium cristatum.*

A. polyblepharum (many-fringed). A synonym of *A. angulare.*

A. triangulare laxum (loose). *fronds* long and very narrow, somewhat drooping. SYN. *Polystichum xiphioides.*

ASPLENIUM. Nearly 350 species of this genus have been described, including plants from all parts of the world where Ferns grow. To the species and varieties described on pp. 127-35, Vol. I., the following should now be added:

A. amboinense (Amboyna). *rhiz.* creeping, clothed with black, subulate scales. *sti.* about 1in. long. *fronds* numerous, evergreen, lanceolate, narrowed below, truncate at apex, having a scaly bud at the end of the midrib, and a small, forked or multifid continuation of the frond. South Sea Islands, 1887. Stove.

A. Campbelli (Campbell's). *rhiz.* small, erect, with a few pale brown scales in the centre. *sti.* tufted, erect, rather strong, 4in. to 6in. long. *fronds* erect, composed of one or two pairs of contiguous, spreading lateral pinnæ, and a slightly larger terminal one, which are lanceolate, acuminate, 3in. to 5in. long, 1¼in. broad, shortly decurrent on the rachis. British and Dutch Guiana, 1885. Stove.

A. Filix-fœmina velutinum (velvety). A beautiful, dwarf, densely branched variety, dwarfer than its parent *A. F.-f. acrocladon*, also closer and more compact in habit: this and the finely-divided apices give the plant the appearance of a ball of green velvet. 1882.

A. furcatum laceratum (torn). *fronds* broader, flatter, and more distinctly incised than in the type.

A. horridum (horrid). *sti.* strong, erect, brownish, fibrillose. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad; pinnæ numerous, spreading, 4in. to 6in. long, acuminate, lobed, cordate or broadly rounded at the base on the upper, truncate on a broad curve on the lower, side; rachis stout, fibrous. *sori* in two nearly parallel lines close to the midrib, a few also on the disk of the lobes. Sandwich Islands, Samoa, and Java, 1884. (H. S. F. iii. 193.)

A. scandens (climbing). *sti.* scattered on a stout, creeping rhizome, very short. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, with numerous horizontal pinnæ on each side, which are 4in. to 6in. long, 1½in. broad, cut down to a distinctly winged rachis into numerous, sub-distant, ovate-rhomboidal pinnules; pinnules cut down to the rachis throughout; lower segments again pinnatifid; ultimate divisions narrow-linear. *sori* solitary, marginal. New Guinea, &c. Stove. SYN. *Darea scandens.*

ASTER. Including *Calimeris.* There are about 200 distinct species of this genus (nearly 350 have been described as such); they are most copious in the Northern hemisphere, particularly in America. To those described on pp. 136-9, Vol. I., the following should now be added:

A. Alberti (Albert Regel's). *fl.-heads* pale purple, terminal, solitary, 1in. in diameter; involucral scales in four series; ray florets linear, spreading. *l.* scattered, linear, slender, acute. Stems ascending, branching. Turkestan, 1884. SYN. *Calimeris Alberti* (R. G. 1152, f. 2, e-g).

A. angustus (narrow). *fl.-heads* numerous, spicately panicled; ray florets reduced to a rudimentary condition. *h.* 1ft. to 2ft. North Asia and North America, 1885. Not worth growing.

A. coriaceus (leathery). A synonym of *Celmisia coriacea.*

A. diplostephioides (Diplostephium-like). *fl.-heads* solitary, inclined, 2in. to 3in. in diameter; involucre broadly hemi-

Aster—*continued.*

spherical, the bracts lanceolate; ray florets bright purple, numerous, biseriate; disk purple. May and June. *l.*, radical ones 2in. to 4in. long, obovate, varying to oblanceolate, acute, entire, narrowed to long or short petioles; cauline ones 2in. to 3in. long, sessile, semi-amplexicaul. Stem stout, 6in. to 18in. high, leafy. Sikkim, 1882. A glandular-pubescent, tomentose, or villous perennial. (B. M. 6718.)

A. gymnocephalus (naked-headed). *fl.-heads* rose-coloured, 1½in. in diameter. Summer and autumn. *l.* narrow-lanceolate, bristly-toothed. *h.* 1ft. to 1½ft. Southern Texas and Mexico, 1879. A pretty, half-hardy annual, of slender, bushy habit. (B. M. 6549.)

A. novæ-angliæ pulchellus (pretty). *fl.-heads* pale magenta. 1882. A very handsome variety, growing about 4ft. high.

A. pseudamellus (false Amellus). *fl.-heads* few, corymbose, 1in. to 1⅔in. in diameter; ray florets bluish-purple; involucral bracts larger than in *A. Amellus*, with reflexed, leafy tips. Autumn. *l.* 1in. to 2in. long, oblong, acute or obtuse, entire or toothed. *h.* 6in. to 18in. Western Himalayas (8000ft. to 13,000ft.), 1886.

A. Stracheyi (Strachey's). *fl.-heads* pale lilac-blue, ¾in. to 1¼in. in diameter; involucral bracts reddish-brown; ray florets linear, the tips minutely notched; scapes rich dark brown, 2in. to 5in. high. May. *l.*, radical ones 1in. to 1½in. long, shortly petiolate, oblanceolate or obovate, pale beneath; those on the stolons much smaller and more sessile; those on the scapes few, linear or linear-obovate. Western Himalayas, 1885. (B. M. 6912.)

A. tricephalus (three-headed). *fl.-heads* one to three, large and showy; ray florets purple. Autumn. *l.*, radical ones obovate-spathulate, on long, winged petioles, entire, glabrous or hairy; cauline ones oblong, half-amplexicaul. Stems puberulous. *h.* 1½ft. Sikkim (10,000ft. to 14,000ft.), 1886.

ASTILBE. The half-dozen species of this genus inhabit the Himalayas, Java, Japan, and North-east America. Only one variety calls for addition to the plants described on pp. 140-1, Vol. I.

A. japonica foliis-purpureus (purple-leaved). An ornamental variety, having purplish stems and foliage. 1885.

ATRAPHAXIS (the old Greek name given by Dioscorides, &c., to Orache). Including *Tragopyron*. ORD. *Polygonaceæ*. A genus embracing about seventeen closely-allied species of hardy, rigid, much-branched shrubs, natives of Central and Western Asia. Flowers often fascicled at the nodes, hermaphrodite, four or five-parted, the two outer segments often smaller; stamens six to eight, rarely nine. Leaves alternate or fascicled at the nodes, narrow or rather small. The species here described are interesting plants. They should be grown in well-drained heath or sandy soil. Very little pruning will be required. Propagation may be effected by cuttings, or by layers.

A. buxifolius (Box-leaved). *fl.* white, nodding, produced in long racemes. July. *fr.* red. *l.* obovate, obtuse, tipped with a short mucro, light green, about 1in. in diameter, the lateral margins undulated, deciduous. *h.* 2ft. Siberia, 1800. SYNS. *Polygonum crispulum* (B. M. 1065), *Tragopyron buxifolium*.

A. spinosa (spiny). *fl.* white, tinged pink. August. *l.* glaucous, ½in. long or less, ovate, acute, sub-evergreen, on short petioles. Branches ascending, horizontal or deflexed. *h.* 2ft. to 3ft. Levant, 1732. (W. D. B. 119.)

ATRIPLEX. About 100 species of herbs and shrubs are included in this genus; they inhabit temperate and sub-tropical regions. Flowers monœcious or dioœcious glomerate. The following species should be added to that given on p. 144, Vol. I.:

A. Halimus (Halimus). *fl.* purplish, small. July and August. *l.* alternate or opposite, rhombic-oblong. *h.* 5ft. to 6ft. Sea-coasts of South Europe, &c., 1640. A loose, rambling, hardy, sub-evergreen, glaucous shrub.

AURICULA. During the last few years considerable improvement has been made in the Show and Alpine Auriculas. A selection of the best sorts is here given:

Green-edged. ABBÉ LISZT, neat plant, truss well formed, tube deep yellow, paste white and dense, black ground-colour, edge light green; AGAMEMNON, a large, bold flower, orange tube, dense white paste, maroon ground-colour, well marked green edge; ATTRACTION, medium green edge, good tube, and white paste, black ground-colour; CYCLOPS, rich yellow tube, good paste, maroon ground-colour; DRAGON, gold tube, white paste, black ground-colour, and deep green edge; EDITH POTTS, yellow tube, good paste, and black ground, with a bright green edge; ENDYMION, red ground and green edge; GREENFINCH, neat flower, yellow tube, good paste and ground-colour; KESTREL, a medium flower, yellow paste, good green edge, and well-proportioned; MONARCH, tube bright yellow, good paste,

Auricula—*continued.*

black ground-colour, and fine green edge; PERAL, yellow tube, good paste, red ground, and lively green edge; VERDANT GREEN, yellow tube, dense paste, black ground, and light green edge.

Grey-edged. AJAX, a constant variety, with yellow tube, white paste, dark ground, and medium grey edge; ATALANTA, yellow tube, paste good, ground-colour maroon, edge silvery-grey; DEERHOUND, large flowers, with deep yellow tube, black ground, edge broad and decided; GRAYLING, orange tube, pure white, dense paste, black ground-colour, and whitish-grey edge; GREY FRIAR, yellow tube, rather thin, white paste, maroon ground, and broad, grey edge; GREYHOUND, the best new Auricula, well-proportioned in all its parts, orange tube, white paste, black ground, and well-developed grey edge; MABEL, a finely-proportioned flower, with a good tube, white paste, black ground, and greenish-grey edge; MARMION, yellow tube, white paste, black ground-colour, and edge well-proportioned; MERLIN, pale yellow tube, dense white paste, black ground, and greenish-grey edge; SAMUEL BARLOW, good yellow tube, white paste, dark maroon ground, and well-defined edge; SEA-BELLE, orange tube, good white paste, black ground, and silvery-grey edge; SEAMEW, yellow tube, good white paste, black ground, and heavy grey edge; WILLIAM BROCKBANK, clear yellow tube, good white paste, bold black ground-colour, and decided grey edge.

White-edged. AMANDA, tube and paste good, bluish ground-colour, and decided white edge; ELAINE, good yellow tube, white paste, black ground-colour, and good white edge; FAIRY-RING, orange tube, white paste, deep violet-red ground, decided white edge; HEATHER-BELL, pale yellow tube, good white paste, bluish ground, and well-defined edge; MAGPIE, orange tube, dense paste, black ground, and well-rounded, pure white edge; MIRANDA, yellow tube, white paste, black ground, edge pure; MRS. DODWELL, yellow tube, white and dense paste, black ground, good white edge; RADIANCE, a well-proportioned flower, good deep yellow tube, dense white paste, black ground-colour, and very pure white edge; RELIANCE, yellow tube, good white paste, black ground-colour, and fair white edge; SNOWDRIFT, a large, circular flower, with gold tube, white paste, black ground, and broad, white edge.

Selfs. BRUNETTE, a rich, dark maroon flower, with good yellow tube and white paste; DUKE OF ALBANY, very dark maroon, yellow tube, very pure white, dense paste; DULCIE, good yellow tube, white paste, and rich maroon edge; FLORENCE, a large, full flower, with good yellow tube, white paste, and reddish-plum-coloured edge; HEROINE, tube bright yellow, paste dense and white, edge rich black-maroon; MELAINE, a well-rounded pip, rich dark maroon, with good tube and paste; MRS. HORNER, yellow tube, white paste, and good violet edge; MRS. POTTS, fine yellow tube, dense, white paste, and bright violet edge; SIR WILLIAM HEWETT, good yellow tube, very round, white paste, and blackish edge.

Alpines. AGNES, white centre, margin shaded violet; AMELIA HARDWIDGE, shaded maroon-crimson; BRIGHT STAR, bright crimson, shaded edge; EMPEROR FREDERICK, crimson, shading to a lighter tint, gold centre; FRED. COPELAND, dark crimson, yellow centre; JOHN BALL, rich crimson, deep yellow paste; KING OF THE BELGIANS, shaded crimson, gold paste; LOVE BIRD, crimson-red, shaded margin; MARINER, shaded purplish-red; MRS. PHIPPS, white centre, maroon margin; PRINCE OF WALES, purplish-red, shaded margin, fine; SENSATION, maroon, shaded margin; TROUBADOUR, crimson margin, gold centre; VICTORIOUS, dark crimson, gold centre.

AZALEA. To the species and varieties described on pp. 149-50, Vol. I., the following should now be added:

A. balsaminæflora alba (white). *fl.* white, produced in large, compact trusses, and lasting a long time in perfection.

A. b. aurea (golden). A form differing from *alba* in its bright yellow flowers.

A. b. carnea (flesh-coloured). *fl.* flesh-coloured, tinted with rose, and also with pale yellow when first expanded. 1887.

A. obtusa (blunt). *fl.* deep red, solitary; segments of the corolla nearly oval and sharp-pointed, the upper one not much smaller than the others, and faintly blotched purple. March. *l.* pilose, oblong, obtuse, narrowed at base. *h.* 2ft. China, 1844. Greenhouse evergreen. (B. R. xxxii. 37; G. C. n. s., xxv., p. 585.)

A. o. alba (white). A variety differing from the type only in the colour of its flowers, which are white, occasionally striped red. 1887.

A. rhombica (rhomboid-leaved). *fl.* usually in pairs; calyx minute; corolla bright rose, 1½in. to 2in. across, sub-bilabiate. May. *l.* sub-conical, 1½in. to 2in. long, assuming a bronzy hue in autumn, the young ones silky, rhombic-elliptic, acute at both ends, hairy above, finely reticulated beneath. Branches slender, stiff, glabrous, the young ones strigose-tomentose. Japan. A much-branched, hardy shrub. SYN. *Rhododendron rhombicum* (B. M. 6972).

Indian Azaleas. The beautiful varieties of *A. indica* are continually being improved, but principally by growers on the Continent, especially in Belgium. The form of the flowers, both of single and double varieties, has been much improved during the last year or two, and the

Azalea—*continued.*

colours are both rich and varied. The subjoined lists comprise the best of the most recent additions.

Double-flowered. AMI DU CŒUR, coral-red, large flower; BARON N. DE ROTHSCHILD, rich violet-purple, dark blotch; CAMELLIÆFLORA PLENA, salmon-red and orange; DEUTSCHE PERLE, white, perfect form; EMPRESS OF INDIA, rosy-salmon and carmine; JOHANNA GOTTSCHALK, large, white, fine form; LOUISE PYNAERT, white, excellent quality; MADELEINE, large, white, semi-double; NIOBE, white, good quality; PHARAILDE MATHILDE, large, white, cerise spots; PRESIDENT OSWALD DE KERCHOVE, salmon-pink; SAKIMTALA, white, free in growth; THEODORE RIEMERS, large, lilac tint; VERVAENEANA, pink, white margin, sometimes striped salmon.

Single-flowered. ANTIGONE, white, striped and blotched violet; APOLLO, large, white, carmine stripes; CANDIDISSIMA, very fine, pure white; COMTESSE DE FLANDRE, large, rose-colour; FÜRSTIN BARIATINSKI, white, striped red; GRANDIS, red, tinged violet; JEAN VERVAENE, salmon, edged and striped white; MONS. PAUL DE SCHRYVER, magenta; MONS. THIBAUT, orange-red, fine form; NEIGE ET CERISE, white, striped and spotted cerise; PERFECTION DE GAND, rosy-purple, large; PRINCESS CLEMENTINE, white, greenish-yellow spots; STELLA, orange-scarlet, tinged violet.

BABIANA. The species number nearly thirty. To those described on p. 152, Vol. I., the following should now be added:

B. socotrana (Socotran). *fl.* solitary, almost sessile; perianth tube 1¼in. long, very slender, the limb pale violet-blue, 1in. broad, two-lipped, the segments elliptic, acute. September. *l.* bifarious, 3in. to 4in. long, ⅔in. broad, narrow-lanceolate; petioles broad, compressed. *h.* 3in. to 4in. Socotra, 1880. (B. M. 6585.)

BÆRIA. California is the home of this genus. To the species described on p. 153, Vol. I., the following should now be added:

B. gracilis (slender). *fl.-heads* bright yellow, solitary, radiate. *l.* opposite, linear. *h.* 6ft. to 10ft. California, 1887. A hardy annual, branching from the base. (R. G. 1887, p. 392.)

BAKERIA. Included under **Plerandra** (which *see*).

BAMBUSA. About two dozen species have been referred to this genus, natives of tropical or sub-tropical Asia, one being broadly dispersed through tropical America. To the species described on pp. 155-6, Vol. I., the following should now be added:

B. Castilloni (Castillon's). *l.* variegated. Stems square, curiously variegated, one side of each internode being dark green, and the other side yellow, these colours alternating at the next internode. Japan, 1886. Hardy. (R. H. 1886, p. 513.)

B. Wieseneri (Wiesener's). Stems brownish-black or dark olive-green. Japan, 1887. Garden variety. A fine, hardy Bamboo, resembling in habit and vigour *Arundinaria japonica* (this being the correct name of the plant described on p. 118, Vol. I., as *A. Metake*).

BARKERIA. This genus is now included, by the authors of the "Genera Plantarum," under *Epidendrum*. To the species described on p. 158, Vol. I., the following should now be added:

B. Barkeriola (Barkeriola). A synonym of *Epidendrum Barkeriola.*

B. cyclotella (circular). *fl.* very showy, disposed in a terminal raceme; sepals and petals deep magenta; lip white, margined magenta, broad, emarginate. February and March. *l.* distichous, ligulate-oblong, acute. Stems as thick as a quill. Mexico. (W. O. A. iv. 148.)

B. elegans nobilior (nobler). A fine, large-flowered variety, having a blackish-purple spot on the lip. 1886.

B. Vanneriana (Vanner's). *fl.* fine rosy-purple, with a small, whitish disk on the lip, equal in shape to those of *B. Lindleyana*; lip rounded, acute, much like that of *B. Skinneri*. 1885. A fine plant, intermediate in character between the two species named.

BARLERIA. This genus embraces about sixty species of herbs and shrubs, mostly natives of Asia and tropical and South Africa, the few American ones being principally Mexican or Columbian. To those described on p. 158, Vol. I., the following should now be added:

B. repens (creeping). *fl.* axillary, solitary, sessile or shortly pedicellate; corolla pale, rather dull rosy-red, 2in. long, the tube funnel-shaped, the limb 1½in. in diameter, of five oblong lobes. July. *l.* opposite, appearing as if fascicled, 1in. to 2½in. long, elliptic-ovate or obovate; petioles ⅛in. to ¼in. long. Stems 1ft. to 2ft. long, prostrate. Eastern tropical Africa, 1875. (B. M. 6954.)

BARROTIA. Included under **Pandanus** (which *see*).

BATEMANNIA. According to Bentham and Hooker, this is now a monotypic genus, the only true species being *B. Colleyi*. Several of the species have been transferred to **Zygopetalum** (which *see*).

BEGONIA. Of this vast genus about 330 species are known; they are mostly natives of tropical America and tropical and sub-tropical Asia and Africa, and are rarely found in the Pacific Islands. To the species and varieties described on pp. 170-9, Vol. I., the following should now be added:

B. albo-picta (white-painted). *l.* shortly stalked, small, elliptic-lance olate, glossy green, freely spotted with bright silvery-white. Brazil. Plant of shrubby habit.

B. Amelia (Amelia's). *fl.* bright rose-coloured, disposed in terminal, trichotomously-branched cymes. *l.* obliquely cordate-ovate, crenulate, shining green. 1885. Habit robust, compact, and branching. A greenhouse, garden hybrid between *B. Bruantii* and *B. Lynchiana*. (R. H. 1885, p. 512, f. 89-90.)

B. Beddomei (Beddome's). T. *fl.* pale rose-coloured, cymose, the males 1½in. in diameter, the females smaller and darker; scape shorter than the petioles, brown-scaly. December. *l.* radical, erect; blade horizontal, 4in. to 6in. in diameter, membranous and pellucid, broadly and obliquely ovate-cordate or orbicular-cordate, obscurely lobed and denticulate, ciliolate, pale green with white spots above, dull red-purple beneath; petioles hairy, 4in. to 6in. long. Assam, 1883. (B. M. 6767.)

B. Bismarcki (Bismarck's). *fl.* light satiny-rose, 1½in. across panicles large, drooping, many-flowered. November and December. *l.* large, lobed, very acuminate, oblique, 6in. long. 1888. Garden variety.

B. Carrieri (Carrière's). This is said to be a hybrid between *B. semperflorens* and *B. Schmidtiana*. The flowers are nearly as large as those of *B. semperflorens rosea*, and are produced much more plentifully. *l.* roundish-ovate, of a bright, cheerful green. Small plants appear to flower with great freedom. 1884.

B. castaneæfolia (Castanea-leaved). A synonym of *B. fruticosa.*

B. Clementinæ (Princess Clementine's). *l.* large, deflexed, roundish-ovate, cordate at the base, the margin lobed; upper surface bronzy-green, irregularly banded greenish-white; under surface rose-coloured, with ribs of a darker hue. A hybrid, said to be raised between *B. diadema* and *B. Rex*. (G. C. ser. iii., vol. iii., p. 265.)

B. compta (adorned). *l.* of a satiny green, a silvery tinge running along the course of the midrib, obliquely ovate, angular. Brazil, 1886. A pretty, stove plant.

B. cyclophylla (round-leaved). T. *fl.* rose-coloured and rose-scented, disposed in a trichotomous cyme, the males 1in. to 1½in. in diameter; scape 6in. high, slender, glabrous. April. *l.* solitary, 6in. broad, orbicular-cordate, with overlapping basal lobes, obtuse or sub-acute, palmately seven to nine-nerved, obscurely denticulate; petiole shorter than the blade. South China, 1885. (B. M. 6926.)

B. decora (decorative). *l.* dark green, profusely dotted with silvery-grey, something in the way of those of *B. maculata*, but the spots more minute, obliquely lanceolate. Brazil, 1886. Stove, shrubby variety.

B. diadema (diadem). *l.* deeply digitate-lobed; lobes irregular, glossy, quite glabrous, light green, irregularly marked with white blotches; under surface with a red zone near the stalk. A handsome foliage plant. Borneo, 1883. (I. H. xxix. 446.)

B. egregia (notable). *fl.* white, ½in. across, many in a gracefully drooping, corymbose cyme 3in. to 4in. in diameter; peduncle 2½in. to 3in. long. Winter. *l.* peltate, 8in. to 11in. long, 2½in. to 4in. broad, obliquely oblong, acuminate, obtusely rounded at the unequal base, hairy; petioles 2½in. to 3in. long. Stem woody below. *h.* 3ft. to 4ft. Brazil, 1887.

B. fruticosa (shrubby). *fl.* pink, small, sub-umbellate; cymes often shorter than the leaves. February. *l.* ovate-oblong, 2in. to 3in. long, seven to nine lines broad, penninerved, shortly petiolate, obtuse or sub-acute at base, repandly serrate-toothed, glabrous, and, as well as the stipules and bracts, persistent. *h.* 3ft. Brazil, 1838. SYN. *B. castaneæfolia.*

B. f. alba (white). A large and robust variety, with white flowers.

B. gracilis racemiflora (racemose-flowered). A useful, decorative variety, of bushy habit, having darker flowers than the type, and red stems. 1836.

B. Hoegeana (Hoege's). *fl.* white, disposed in lax, axillary cymes, only half as large as those of *B. nitida* (which this plant somewhat resembles). *l.* broadly ovate, rounded at base, scarcely oblique. Mexico, 1886. A very glabrous, greenhouse climber.

B. hybrida coccinea (red). *fl.* bright scarlet, freely produced. Winter. A desirable hybrid, of dwarf, compact habit.

B. Johnstoni (Johnston's). *fl.* pale rose-coloured; males 1½in. to 2in. in diameter, with four broadly oblong sepals, and numerous

Begonia—*continued.*

stamens; females smaller, with five sepals; cymes four to six-flowered; peduncles long. April. *l.* 4in. to 6in. long, obliquely ovate, acute, coarsely crenate, deeply two-lobed at the lateral base, hairy; petioles 4in. to 6in. long. Stem succulent, 1ft. to 1½ft. high, and, as well as the branches, petioles, peduncles, and pedicels, marked with scarlet striæ. Tropical Africa, 1884. (B. M. 6899.)

B. Lubbersii (Lubbers').* *fl.* white, tinged green, large, in axillary, nodding cymes of about six. *l.* alternate, distichous, smooth, entire, peltately attached to fleshy petioles; stipules large, ovate, persistent, bright red. Stems cylindrical, green, deflexed at the tips. Brazil, 1884. A handsome, sub-shrubby species. (B. H. 1883, 13.)

B. manicata aureo-maculata (golden-spotted). *l.* round, mottled with white.

B. Margaritæ (Margaret's). *fl.* pale rosy, large, in corymbose cymes; sepals of the males orbicular, having a large tuft of rosy hairs at the base. *l.* large, obliquely cordate-ovate, dark, shining green, with purple reflections. 1884. A garden hybrid between *B. echinosepala* and *B. incarnata metallica*, of tall and vigorous habit. (R. H. 1884, p. 200, f. 48.)

B. Meysseliana (Meyssel's). *l.* pale green, ornamented with silvery spots. Sumatra, 1884. A stove or greenhouse, foliage plant, suitable for outdoor decoration in summer.

B. olbia (rich). *fl.* white, in small cymes, freely produced from the axils of the leaves. *l.* oblique, five-nerved, irregularly toothed, slightly bullate, the upper surface of a very dark bronzy-green, covered with small, reddish hairs, and studded with small, neat, round, white spots, the under surface of a deep red; petioles erect. Stems short, fleshy. Brazil, 1883. (F. & P. 1884, 603.)

B. rubella (reddish). *l.* numerous, obliquely ovate, lobed, toothed, ciliated, bronzy-green, the veins marked out with pale green, spotted all over with purplish-brown, the under surface red. Stems stout, decumbent. India, 1883.

B. semperflorens rosea (rosy). *fl.* bright rose-coloured, the petals white at base. 1883. A pretty, free-flowering, garden variety. (R. H. 1881, p. 330.)

B. s. Sturzii (Sturz'). *fl.* rose-pink, disposed in cymose panicles. *l.* whitish-spotted. 1886. A fine, floriferous variety. (R. G. 1220.)

B. socotrana. Seedling hybrid forms have been obtained by crossing the summer-flowering, tuberous, garden varieties with *B. socotrana*. The following are of great horticultural value, and the richly-coloured sprays of flowers are valuable for placing in vases: ADONIS, flowers rosy-carmine, medium-sized, leaves large and handsome, habit robust and erect: AUTUMN ROSE, flowers rose-pink, pretty, intermediate between those of *B. incarnata* and *B. socotrana* (the pollen parent); JOHN HEAL, flowers clear rose, lasting for two or three weeks, leaves much smaller than those of ADONIS, habit graceful; WINTER GEM, flowers more crimson than carmine, freely produced, leaves rhomboid, more like *B. socotrana* than the other hybrids. The first three can be freely propagated by cuttings; but the last can only be increased by the small tubers at the base of the stem.

Varieties. The improvement in this popular greenhouse flower has been quite marvellous during the last few years. The single and double varieties of the tuberous section have been obtained of the finest form, and of the richest and most varied colours: white, blush, pale rose, and salmon to the richest, darkest crimson. We have also clear yellow, orange, bronze, apricot, and such tints as are seldom seen in garden flowers. The following is a very select list from the numerous varieties quite recently introduced:

Single-flowered. ANAK, deep rose, very large flowers; BARONESS ROTHSCHILD, scarlet, white centre; BEAUTY, scarlet, white centre; BLACK KNIGHT, very dark crimson; BRIDESMAID, pure white; COUNTESS, orange-yellow; COUNTESS OF ROSSLYN, bronzy-orange; DISTINCTION, crimson, white centre; DOWAGER LADY WYNN, white, shaded violet-rose; DUCHESS OF EDINBURGH, yellow, shaded orange; DUKE OF EDINBURGH, reddish-maroon; EARL OF CHESTERFIELD, rich crimson; EXCELSIOR, yellow; FAIRY QUEEN, white, edged pale pink; GOLDEN QUEEN, clear rich yellow; GUARDSMAN, vermilion; HER MAJESTY, pale pink; LADY CLONCURRY, salmon-pink, white centre; LADY IDDESLEIGH, bronzy-yellow; LORD LEWISHAM, scarlet; LORD SALISBURY, deep red; LOVELINESS, white, violet-crimson margin; MAIDEN'S BLUSH, blush, tinted rose; MR. CULLINGFORD, rosy-red; MRS. LEGH, intense crimson-scarlet, shaded violet; MRS. MILNER, soft rosy-pink; MRS. SHEPHERD, purest white; NORMA, magenta-red; NOVELTY, salmon-red, new colour; PRINCE OF WALES, scarlet; PRINCESS LOUISE, white; PRINCESS OF WALES, full rosy-pink; PRINCESS VICTORIA, rosy-red; ROSEA COMPACTA, rose, handsome form; ROSE CELESTE, rich rosy-pink; ROSY MORN, delicate rose; TOREY LAING, orange, red, and yellow; WHITE PERFECTION, pure white, fine.

Double-flowered. ADONIS, salmon, light centre; ALBA FIMBRIATA, pure white, fringed; ALBA MAGNA, very large, pure white;

Begonia—*continued.*

ALBA ROSEA, pink, white centre; ARGUS, purplish-rose; CAMELLIA, deep reddish-scarlet; CANNELL'S TRIUMPH, pink, very large; CLARIBEL, pale rose, white centre; DAVISII GIGANTEA FLORE-PLENO, reddish-crimson; DR. MASTERS, blush, large, well-formed flowers; DUCHESS OF TECK, clear yellow, very large; EDELWEISS, very fine white; GIGANTEA, large clusters of salmon-rose flowers; GLOW, intense scarlet; HARTINGTON, rose; H. BARNET, dark crimson; IONA, salmon-scarlet (hybrid from DAVISII); I. WALKER, crimson-scarlet, large; JUBILEE, magenta-rose, large, full flower; LADY JULIAN GOLDSMID, bright pink, large; LADY LENNOX, rich yellow, full; LADY ROTHSCHILD, pink, large outer petals; LEONORA, pink, with paler margin; LILLIE, salmon-rose, white centre; LORD LOUGHBOROUGH, bright scarlet; LORD ROTHSCHILD, pink, large flowers; MAJOR LENDY, pink, with yellow tinge; MARGINATA, white, pink margin; MARQUIS OF STAFFORD, creamy-white; MR. H. ADCOCK, crimson-scarlet; MRS. B. WYNNE, salmon; MRS. CARTER, bright rose; MRS. J. MIDSON, white; MRS. LEWIS CASTLE, salmon shaded; MRS. W. B. MILLER, soft salmon; MRS. W. F. BENNETT, soft yellow, large; PERFECTION, deep salmon-red, large; PRINCESS MAUD, pure white, full flower; ROSY GEM, deep rose; SCARLET PERFECTION, vivid scarlet; SHIRLEY HIBBERD, creamy-white, tinged blush; SIR J. PENDER, rich salmon; TERRA-COTTA, very distinct buff colour; VISCOUNTESS CRANBROOK, deep rose, flaked white.

BERBERIS. Nearly 100 species have been described as such, but not more than fifty are botanically distinct; about fifteen are Asiatic, one is found in Europe and North America, and the rest inhabit the mountainous parts of America, from Oregon to Tierra del Fuego. To the species described on pp. 181-2, Vol. I., the following should now be added:

B. congestiflora hakeoides (crowded-flowered, Hakea-like). *fl.* golden-yellow, in dense, globose, simple or compound heads ½in. to ¾in. in diameter, which are sessile or pedunculate. Early spring. *l.* 1in. to 2in. long, almost imbricating, sessile or shortly petiolate, orbicular or very broadly oblong, thickly coriaceous, rigidly spinous-toothed, rounded or cordate at base. *h.* 6ft. to 7ft. Chili, 1861. A stout bush. (B. M. 6770.)

B. nepalensis Bealei (Beale's). A remarkably handsome, Chinese form, with grand spikes of closely-packed flowers. 1887. (G. C. ser. iii., vol. i., p. 608.)

B. Thunbergii (Thunberg's). *fl.* numerous, small, ¼in. to ⅓in. across, drooping; sepals red, half as long as the petals, which are pale straw-coloured, suffused with red. April. *l.* in crowded tufts all along the branches, ⅓in. to nearly 1in. long, obovate or spathulate, entire. Spines straight, ⅓in. long. Japan, 1883. A low bush. (B. M. 6646.)

BETULA. This genus comprises about twenty-five species, broadly dispersed over Europe, Central and North Asia, and North America. To those described on p. 186, Vol. I., the following should now be added:

B. Medwediewi (Medwediew's). *fl.*, catkins cylindrical, the males about 1¼in. long, the females shorter. *l.* elliptic-ovate, acutely toothed, glabrous, the midrib beneath and the petiole pubescent. Branches glabrous. Transcaucasus, 1887. (R. G. 1887, p. 394, f. 1-4.)

B. Raddeana (Radde's). *fl.*, catkins ovoid-oblong, ⅔in. to 1in. long. *l.* small, ovate, acutely toothed, pubescent beneath on the nerves and in the angles of the nerves. Young shoots softly pubescent. Caucasus, 1887. (R. G. 1887, p. 384, f. 5-11.)

BIFRENARIA. About ten species, natives of Brazil, Guiana, and Colombia, compose this genus. To those described on p. 187, Vol. I., the following should now be added:

B. bella (beautiful). A synonym of *Cœlia bella*.

B. Harrisoniæ (Mrs. Harrison's). *fl.* 3in. across; sepals and petals creamy-white, large and fleshy, the lateral ones with a spur-like base; lip purple, yellowish at base, purple-veined outside, the inner surface streaked red; scape one or two-flowered. *l.* solitary, large, oblong-lanceolate, plaited. Pseudo-bulbs pyriform, tetragonal. Brazil. SYNS. *Colax Harrisoniæ*, *Dendrobium Harrisoniæ* (H. E. F. 120), *Lycaste Harrisoniæ*, *Maxillaria Harrisoniæ* (B. M. 2927; B. R. 897; P. M. B. ii. 196.)

B. H. alba (white). *fl.* white; sepals slightly tinged green, the lower sides of the lateral ones faintly dotted red; side lobes of the lip reddish-purple, veined with deeper red, the middle lobe red-purple, hairy, the spur-like portion greenish-white. Brazil. (R. G. 52, under name of *Maxillaria Harrisoniæ alba*.)

B. H. eburnea (ivory-white). *fl.*, sepals and petals white; lip white, freely striped with crimson; throat yellow, striped purplish-red. April and May. Brazil. A chaste variety. (W. O. A. iii. 100, under name of *Lycaste Harrisoniæ eburnea*.)

B. H. grandiflora (large-flowered). *fl.*, inner surface of the lip wholly purple, except a narrow, yellowish border; spur yellow, with a few bold, purple stripes.

BIGNONIA. This genus embraces about 120 species, all American, and mostly tropical. To those described on p. 189, Vol. I., the following should now be added:

B. regalis (royal). *fl.* bright yellow and red, large and exceedingly beautiful. *l.* opposite, elliptic-lanceolate. British Guiana, 1885. A very handsome climber.

BILLBERGIA. Tropical America is the home of the score species included in this genus. To the species and varieties described on pp. 190-1, Vol. I., the following should now be added:

B. andegavensis (Angers). *fl.* having a spreading limb, the tube and centre dark red, broadly bordered with violaceous-indigo; bracts bright red; flower-stem arching, mealy-white. *l.* broad, obtuse, pale green. 1886. A garden hybrid between *B. thyrsoidea* and *B. Moreli*.

B. Breautéana (Breauté's). *fl.* pale flesh-colour, with violet tips; bracts bright rose, lanceolate; stem shorter than the leaves, recurving, glabrous. *l.* 2ft. long, 2in. broad, recurving, lorate, obtuse, slightly channelled, rather thin, bordered with five distant teeth, bright green above, striated and with mealy-white zones below. 1884. A garden hybrid between *B. pallescens* and *B. vittata*. (R. H. 1885, p. 300.) SYN. *B. Cappei*.

B. Bruanti (Bruant's). *fl.*, calyx very pale green, tipped with blue; corolla very pale yellowish-green; bracts dark red; stem rosy, slender, nearly as long as the leaves. *l.* green, obtuse, toothed, forming a cup-like rosette. 1885. A garden hybrid between *B. pallescens* and *B. decora*.

B. Cappei (Cappe's). A synonym of *B. Breautéana*.

B. decora (comely). *fl.*, petals greenish, 2in. long, curling up spirally from the base; spike dense, pendulous, simple, 3in. to 4in. long, almost hidden by the large, bright red, oblong-lanceolate bracts; peduncle 1ft. long. January. *l.* eight or ten in a rosette, lorate, acute, 1½ft. to 2ft. long, 2in. broad in the middle, dilated and clasping at base, with transverse, mealy bands, the margins spiny. Amazon Valley, 1864. (B. M. 6937.)

B. Enderi (Ender's). *fl.* blue, ¾in. long; bracts bright coral-red; spike short, few-flowered; scape longer than the leaves, the sheaths bright coral-red. *l.* 1ft. to 1½ft. long, 1½in. to 2in. broad, ascending. Brazil, 1886. (R. G. 1217.)

B. Euphemiæ (Mme. Morren's). *fl.* six to twelve in a lax, drooping raceme, nearly sessile, the lower ones subtended by large bracts; sepals reddish, horny; petals about 2in. long, with greenish-yellow claws and bright violet tips. *l.*, produced ones five or six in a closely convolute rosette, about 1ft. long, 1½in. to 2in. broad, horny, narrowed to an acute point, lepidote-scaly, the margins minutely prickly. Brazil. (B. M. 6632.)

B. Gireoudiana (Gireoud's). *fl.* on an upright spike; calyx with triangular sepals, rose, faintly bluish towards the tips; petals twice as long as the sepals, linear-lanceolate, blunt, the claw reddish-white at the base, azure-blue at the tip; scape white, with a number of narrow-ovate, carmine-red bracts. *l.* broadly strap-shaped (the inner ones rolled round each other into a wide tube), finely serrated, bright green above, beset with numberless whitish scales, the lower surface striped red, deep blackish-purple towards the base. A garden hybrid, of which *B. thyrsoidea* is one of the parents.

B. Glazioviana (Glaziou's). *fl.* in a dense, ovate-oblong spike; sepals white-woolly, elliptic-oblong; petals at first violet-rose, at length reddish-brown, oblong, erect, cucullate-obtuse towards the apex; bracts elliptic-oblong, imbricated; scape red, white-woolly, one-third shorter than the leaves. *l.* coriaceous, channelled, ligulate, acuminate, 2½ft. to 3ft. long, 2½in. broad, dark green and glabrous above, dark green with silvery-lepidote horizontal zones beneath, the margins shortly spiny-toothed. Brazil, 1885. (R. G. 1203.)

B. Porteana (Porte's). *fl.*, petals green, lanceolate, above 2in. long, rolling up spirally and disclosing the violet-purple filaments; spike loose, simple, drooping, 6in. to 8in. long; peduncle 2ft. long, with several bright red bract leaves. Summer. *l.*, produced ones five or six in a rosette, erect, lorate, 3ft. to 4ft. long, dull green, tinted on the back with claret-purple, and transversely banded with white. Brazil. Plant stemless. (B. M. 6670.)

B. Rancougnei (Rancougne's). *fl.*, corolla bluish-green, tipped with indigo, 2in. long; stamens indigo; bracts rosy, woolly-tomentose at the base, together with the ovary and calyx; stem 3ft. high. *l.* 3ft. long, 2½in. broad, spreading-recurved, finely toothed. 1885. A hybrid, of which *B. Liboniana* is one of the parents.

B. rhodocyanea (red and blue). *fl.* arranged in a capitate thyrse, clothed with numerous rose-coloured bracts; petals at first rose-coloured, then white, gradually passing into blue, the petals slightly convolute. *l.* radical; outer ones 1ft. to 1½ft. long, the inner ones gradually shorter and more upright, all ligulate, obtuse, with an acuminate mucro, tinged purple and transversely banded with whitish lines, the sides incurved, the margins sharply prickly. (B. M. 4883; F. d. S. 207; R. H. 1857, p. 482.)

B. r. purpurea (purple). This plant is distinguished from the type in having all its parts red instead of light green.

Billbergia—*continued.*

B. Sanderiana (Sander's). *fl.* 2in. long; calyx and corolla green, tipped with blue; bracts rosy, with one to three flowers to each; panicle pendulous. *l.* erect, broad, green, coriaceous, obtuse, mucronate, armed with stout spines on the margins. Brazil, 1885. A fine plant. (B. H. 1884, 1-2.)

B. thyrsoidea splendida (splendid) *fl.* scarlet, tipped with violet; bracts scarlet, large. Brazil, 1883. A handsome form. (R. H. 1883, p. 300.)

B. Windii (Wind's). *fl.* few, racemose, about 3in. long; sepals iridescent, reddish at base, blue at the tips, ½in. long; corolla greenish-yellow, the lobes 2in. long, circinately rolled up; bracts rich, bright rosy-crimson, boat-shaped, broadly lanceolate, acuminate; peduncle cylindrical, glabrous, pendulous, 1ft. long. Belgian gardens, 1884. A pretty hybrid between *B. Baraquiniana* and *B. nutans*.

B. Worleana (Worlee's). *fl.* about a dozen; calyx rosy and blue; corolla dark blue; scape adorned with numerous rosy bracts, long, slender, arching. 1885. A graceful and ornamental hybrid between *B. nutans* and *B Moreli*, having the outer leaves narrow, as in *B. nutans*, and the inner ones broader, as in *B. Moreli*.

BILLIOTTIA (of Brown). A synonym of **Agonis** (which *see*).

BISMARCKIA (commemorative, in honour of the great German statesman). ORD. *Palmæ*. An imperfectly known genus. *B. nobilis*, the only species, is an ornamental Palm, with somewhat the habit of a Pritchardia. For culture, *see* **Stevensonia,** on p. 502, Vol. III.

B. nobilis (noble). *fr.* one-celled, with two rudimentary cells; seeds ovoid, deeply wrinkled. *l.* large, digitately divided into from eight to ten long-linear segments and several drooping, thread-like ones. Madagascar, 1886. (R. G. 1220.)

BLECHNUM. This genus comprises about a score species of closely resembling Ferns, widely diffused throughout tropical and South temperate regions. To those described on pp. 193-5, Vol. I., the following should now be added:

B. rugosum (wrinkled). *sti.* 3in. to 6in. long, densely glandular-hairy above, as is the rachis. *fronds* linear-lanceolate, acuminate, about 1ft. long, the surface wrinkled, glandular-hairy; pinnæ with a stalk-like base below, confluent above, oblong, blunt or sometimes abruptly acute, falcately curved. *sori* linear, medial, extending from the base nearly to the apex of the pinnæ. 1884. Greenhouse.

BLETIA. About a score species have been referred to this genus; they are mostly natives of tropical America, with one Chinese and Japanese. To those described on p. 196, Vol. I., the following should now be added:

B. graminifolium (Grass-leaved). A synonym of *Arundina bambusæfolia*.

B. hyacinthina albo-striata (white-striated). A pretty variety, having all the nerves of the leaves white. It will thrive in the cool house.

B. Thomsoniana (Thomson's). A synonym of *Schomburgkia Thomsoniana*.

BOLLEA PULVINARIS. This does not appear to differ from **Zygopetalum cœleste** (which *see*, on page 245).

BOMAREA. Upwards of fifty species, all American, have been referred to this genus. To those described on p. 200, Vol. I., the following should now be added:

B. Kalbreyeri (Kalbreyer's). *fl.* pedicellate, in large, terminal umbels, the three outer segments brick-red, about 1in. long, oblong-spathulate, the three inner ones orange-yellow, spotted red, longer than the outer ones, obovate-cuneate. *l.* shortly stalked, oblong, acuminate, glabrous above, downy beneath. New Grenada, 1883. (R. H. 1883, p. 546.)

B. vitellina (egg-yolk-colour). *fl.* of a rich, deep orange-yellow, narrowly-campanulate, 2in. long, numerously disposed in large, drooping, umbellate cymes; outer and inner perianth segments unequal in length. *l.* ovate-oblong, acute. Stems smooth. Columbia, 1832. A very beautiful, tuberous-rooted climber, adapted for conservatory decoration. (G. C. n. s., xvii., p. 151.)

BOOPHANE. *See* **Buphane.**

BORONIA. Australia is the home of this genus, which embraces about fifty species. Only one plant calls for addition to those described on p. 203, Vol. I.

B. heterophylla brevipes (variable-leaved, short-stalked). *fl.* bright scarlet, whorled at the leaf axils, usually in fours or sixes, drooping, sub-globose, ¼in. to ½in. in diameter; petals broadly ovate, concave, sub-acute. April. *l.* very variable, sometimes quite simple, 1in. to 1½in. long, narrowly linear, apiculate, sometimes with one or two pairs of linear leaflets. Western Australia, 1881. An erect shrub, "said to attain the height of a man." (B. M. 6845.)

BOUGAINVILLÆA. This genus comprises seven or eight species of shrubs or small trees, rarely sarmentose or somewhat climbing, natives of tropical and sub-tropical South America. Flowers inserted below the middle of the bracts; perianth tubular, slightly curved; inflorescences solitary or fascicled, axillary or terminal. Leaves alternate, petiolate, rounded-ovate or elliptic-lanceolate, entire. To the species described on pp. 205-6, Vol. I., the following should now be added:

B. refulgens (shining). *fl.*, bracts brilliant purple-mauve, produced in long, pendulous racemes. *l.* dark green, pubescent. Brazil, 1887. Stove.

BOUVARDIA. This genus comprises about twenty-six species of herbs and shrubs, mostly Mexican. To the species and hybrids described on p. 207, Vol. I., the following should now be added:

B. scabra (scabrous). *fl.* bright pink, ½in. in diameter, freely produced in dense, corymbose cymes; corolla tube ten to twelve lines long, the lobes elliptic-ovate, sub-acute. January. *l.* in distant whorls of three or rarely four, ovate, acuminate, narrowed to a very short petiole; lower ones 2in. to 3in. long, 1in. to 1½in. broad, the upper ones gradually smaller. Stems terete, herbaceous, hairy, 1ft. to 1½ft. high.

Hybrids. These choice greenhouse flowers are being more sought for year by year, owing to their great value for late autumn and winter flowering, especially for the purpose of making up small bouquets, and for table decoration. The following are valuable additions:

CANDIDISSIMA, pure white; INTERMEDIA, salmon-pink; ROSALIND, salmon; SANG LORRAINE, vermilion, double; UMBELLATA ALBA, white; VICTOR LEMOINE, bright scarlet, very double.

BRAHEA. Of the four known species of this genus, one is indigenous to Mexican Texas and the mountains of Mexico, and the rest inhabit Mexico and the Andes. To that described on p. 209, Vol. I., the following should now be added:

B. nitida (shining). *fl.*, spadix very large, much-branched, glabrous. *fr.* black, about the size of a pea. *l.* large, fan-like, palmately cleft, glaucous-green. Mexico, 1887. (R. H. 1887, p. 344, f. 67-70.)

B. Roëzlii (Roëzl's). A synonym of *Erythea armata*.

BRASSAVOLA. Several species formerly included here are now referred to *Lælia*.

BRASSIA. This genus embraces about a score species. To those described on pp. 209-10, Vol. I., the following should now be added:

B. cinnamomea (cinnamon). A synonym of *B. Keiliana*.

B. elegantula (rather elegant). *fl.* small; sepals green, with brown bars, spreading; lip white, with two keels, hairy inside, dotted purplish-brown in front of the calli; raceme two to five-flowered. *l.* and pseudo-bulbs glaucous. Mexico, 1885. An elegant species.

B. Keiliana (Keil's). *fl.* disposed in a loose, many-flowered raceme; sepals and petals at first yellow, eventually turning brownish-orange; lip whitish; bracts boat-shaped, longer than the ovaries. New Grenada. A dwarf and compact species: it will thrive in the Cattleya house. SYNS. *B. cinnamomea*, *Oncidium Keilianum*.

B. maculata major (larger). *fl.* freely produced; sepals and petals greenish-yellow, spotted brown; lip white, spotted dark brown. Jamaica.

BRAVOA. There are two or three species, natives of Mexico. Flowers twin; perianth persistent, incurved below the middle, the lobes short, ovate, sub-equal; racemes long. Radical leaves few, ligulate, long-lanceolate, or linear; cauline ones rare, much smaller. To the species described on p. 211, Vol. I., the following should now be added:

B. Bulliana (Bull's). *fl.*, perianth whitish, tinged greenish-purple outside, dull yellow within, 1¼in. long, funnel-shaped, the tube abruptly curved at the middle; raceme 6in. long, with five or six pairs of flowers; peduncle flexuous, 2ft. to 3ft. long. *l.* three, lanceolate, 6in. long, 1½in. broad, acuminate. 1884.

BRIZA. The ten species of this genus inhabit Europe, North Africa, temperate Asia, and South America. Leaves flat or narrowly convolute, sometimes bristly. To the species described on pp. 211-2, Vol. I., the following should now be added:

Briza —*continued.*

B. rotundata (round). *fl.* disposed in narrow panicles; spikelets erect. *l.* erect, narrow. Mexico, Brazil, and Chili, 1887. An ornamental, annual Grass. (R. G. 1887, p. 638.)

BRODIÆA. About thirty species, all extra-tropical American, compose this genus. To those described on p. 213, Vol. I., the following should now be added:

B. Douglasii (Douglas'). *fl.* violet-blue, inodorous, ten to twenty in a dense umbel; perianth funnel-shaped, 1in. long, the segments oblong, acute; scape slender, 1ft. to 1½ft. long. May. *l.* generally two, light green, flaccid, deeply channelled, shorter than the scape. Bulb small, globose. California, &c., 1876. (B. M. 6907.)

B. grandiflora Warei (Ware's). *fl.* lilac-rose, 3in. long; scape 2ft. to 2¼ft. high. California, 1886. A beautiful variety.

BROMELIA AMAZONICA. A synonym of **Karatas amazonica** (which *see*).

BROWALLIA. Tropical America is the home of the half-dozen species included in this genus. To those described on p. 214, Vol. I., the following should now be added:

B. viscosa (viscous). *fl.*, calyx segments lanceolate, acute; corolla with violaceous, obovate, emarginate segments, the largest spotted white at base, the tube whitish, inflated at top; peduncles crowded at the tops of the branches. Summer. *l.* roundish-ovate, obtuse, hairy, 1in. to 1½in. long. *h.* 1ft. to 2ft. New Grenada. Half-hardy annual. (R. G. 142.)

BRUNSVIGIA. This genus embraces seven or eight species. To those described on p. 216, Vol. I., the following should now be added:

B. magnifica (magnificent). *fl.* twenty to thirty; perianth tube short, the segments white, with a broad, reddish-purple, central stripe, lanceolate-oblong, reflexed, 3½in. long; peduncle brown, 4in. long. *l.* oblong, deeply channelled, acuminate, serrated, 1½ft. to 1¾ft. long, 3½in. broad, recumbent. Bulb large, globose. 1885. (I. H. 1885, 552.) This "is a *Crinum*, either identical with *Forbesianum* or near it" (J. G. Baker).

BULBOPHYLLUM. Of this genus there are about eighty species, mostly dispersed through tropical Africa and Asia; a few are South American or Australian, and one is found in New Zealand. To those described on p. 222, Vol. I., the following should now be added:

B. grandiflorum (large-flowered). *fl.* solitary, large, densely reticulated with brown on a pale ground; sepals lanceolate-attenuate, 4in. to 5in. long, free, the upper one twice as broad as the lateral ones, strongly arching over at the base, and hanging down in front. *l.* solitary, elliptic, 2½in. to 3in. long. Pseudo-bulbs about 1in. long, distant, four-angled. Rhizome creeping. New Guinea, 1887. More grotesque than beautiful.

B. saurocephalum (lizard's-head). *fl.* very curious; sepals light ochreous, nerved brown; petals white, with reddish midline and borders, small; lip ochreous, deep purple at base; rachis bright red, thick, clavate, loaded with flowers. Pseudo-bulbs four or five-angled, one-leaved. Philippine Islands, 1886. An interesting species.

B. Sillemianum (Sillem's). *fl.*, sepals short, blunt, triangular; petals nearly orange, shorter, ligulate-falcate; lip mauve above, whitish beneath, cordate at base, five-angled, with a reflexed apex; column very short. *l.* cuneate-ligulate, acute. Pseudo-bulbs nearly spherical. Birma, 1884.

BUPHANE (a misprint, subsequently corrected by Herbert, for *Buphone*, from *bous*, an ox, and *phone*, destruction, in allusion to the poisonous properties of the plant; but *Buphane* is the name adopted by the authors of the "Genera Plantarum," and by Baker in his "Amaryllideæ"). Originally *Boophane*. ORD. *Amaryllideæ*. A small genus (two species) of greenhouse, bulbous plants, natives of tropical and South Africa. Flowers long-pedicellate, numerous in an umbel; perianth funnel or salver-shaped, with a short tube, and equal, linear lobes; involucral bracts two; scape solid. Leaves loriform, appearing late. For culture, *see* **Brunsvigia**, on p. 216, Vol. I.

B. ciliaris (ciliated). The correct name of the plant described on p. 216, Vol. I., as *Brunsvigia ciliaris*.

B. disticha (two-ranked). Cape Poison Bulb. The correct name of the plant described on p. 216, Vol. I., as *Brunsvigia toxicaria*.

BURLINGTONIA. According to Bentham and Hooker, *Rodriguezia* is the correct name of this genus, which comprises about twenty species, natives of tropical America, from Brazil as far as Central America. To those

Burlingtonia—*continued.*

described on p. 225, Vol. I., the following should now be added:

B. caloplectron (beautiful-spurred). A synonym of *Rodriguezia caloplectron.*

B. Farmeri (Farmer's). *fl.* white and yellow, freely produced. Early summer. Native country unknown. A pretty species, resembling *B. candida.* It should be grown on a block, or in a basket with Sphagnum.

B. Knowlesii (Knowles'). *fl.* white, with a faint tinge of lilac-pink, disposed in long racemes. Autumn. Native country unknown. A scarce but beautiful species, resembling *B. venusta.*

CACCINIA (named in honour of G. Caccini, an Italian savant). SYN. *Anisanthera.* ORD. *Boragineæ.* A small genus (five species) of hardy, perennial herbs, natives of the Orient. Flowers pedicellate, at length scattered; calyx five-cleft; corolla salver-shaped, with a slender tube and five spreading lobes; stamens five; racemes elongated, bracteate. Nutlets four, or by abortion fewer. Leaves alternate, the margins scabrous-ciliated. *C. glauca,* the only species in cultivation, thrives in any fairly good soil, and may be propagated by divisions.

C. glauca (greyish). *fl.* in racemose cymes; calyx lobes greenish-brown; corolla tube not exserted, the lobes violet-blue, turning red, ¼in. long, oblong-lanceolate. *l.* 4in. to 8in. long, shortly petiolate, or the upper ones sessile, elliptic-oblong, sparsely tubercled. Stem below as thick as the thumb. *h.* 1ft. to 3ft. Persia and Afghanistan, 1880. (B. M. 6870.)

CADIA (this name is an alteration of the Arabic *Kadi*). SYNS. *Panciatica, Spaendoncea.* ORD. *Leguminosæ.* A small genus (three species are known) of stove, evergreen shrubs, natives of Eastern tropical Africa, Southern Arabia, and Madagascar. Flowers whitish, pink, or purple, solitary in the axils or few in a raceme, pendulous; calyx broadly campanulate, with nearly equal lobes; petals nearly all alike, free, erecto-patent, oblong-ovate or sub-orbicular, very shortly clawed; stamens free, subequal; bracts small; bracteoles wanting. Pods linear, acuminate, two-valved. Leaves impari-pinnate; leaflets small, exstipellate; stipules minute. *C. Ellisiana,* the only species yet introduced, is a small, slender, perfectly glabrous bush, requiring similar culture to **Brownea** (which *see,* on p. 215, Vol. I).

C. Ellisiana (Rev. W. Ellis'). *fl.* rose-red, 1½in. long; petals twice as long as the calyx, obovate-spathulate, convolute, forming a campanulate corolla; racemes short and shortly pedunculate, axillary. December. *l.* alternate, 4in. to 6in. long; leaflets distant, alternate, spreading, very shortly petiolulate, 3in. to 4in. long, elliptic-oblong or lanceolate, obtusely acuminate; petioles very short, swollen at base. Madagascar, 1882. (B.M.6685.)

CÆSALPINIA. This genus comprises about thirty-eight species, distributed over the warmer regions of the globe. To those described on p. 232, Vol. I., the following should now be added:

C. crista (crest). A synonym of *C. japonica.*

C. japonica (Japanese). *fl.* whitish, terminal, racemose, drooping; peduncles alternate, filiform, horizontal, one-flowered. May and June. *l.* pinnate; leaflets sub-sessile, oblong, very obtuse, entire, equilateral, glabrous. Stem 6ft. high, arborescent. Japan. (G. M. 21st July, 1888, p. 445.) SYN. *C. crista.*

CALADIUM. The most recent additions to this genus of plants grown and valued for the beauty of their foliage have been conspicuous for great distinctness in the coloration and markings on the upper surface of the leaves. Many of the varieties have obtained first-class certificates from the principal metropolitan floral and horticultural societies. The following is a selection of the very best:

ALBO-LUTEUM, white, with yellow and green; ANNA DE CONDEIXA, of thin texture, the midribs deep red, with rosy centre; AUGUSTE CARPENTIER, richly coloured, deep red at the centre; BARONNE JAMES DE ROTHSCHILD, rosy tinted, with deep red veins; BELLONE, rosy-red, with darker veins, the colours becoming intensified as the leaves grow to their full size; CANDIDUM, white, the venation bright green, one of the very best; CARDINALE, crimson, spotted and marked green and yellow, distinct and handsome; CHARLEMAGNE, reddish, the venation dark red, very handsome; CLIO, rose, shading off to a whitish tint, the veins green; COMTE DE GERMINY, red and yellow, marbled white, a handsome form; COMTESSE DE CONDEIXA, white

Caladium—*continued.*

ground, tinted red, veined deep red, edged green; DUCHESSE DE MORTEMART, transparent white, very distinct; ELSA, pale rose, blotched and spotted red, with green venation and margin; FERDINAND DE LESSEPS, dark red, with paler midrib and venation, and green margin; GASPARD GAYER, green, with red midrib and venation; L'AUTOMNE, yellowish, with bluish spots; LE TITIEN, green, with deep purplish-red midrib and veins; MADAME IMBERT KÆCHLIN, green, with crimson spots; MADAME LEMONIER, pale red or rose, with red midrib and veins, and yellowish centre; MADAME MITJANA, crimson, with purplish centre, of thin texture; MINUS ERUBESCENS, crimson, with green margin, small; ORNATUM, rich green, with crimson midrib and venation; RAYMOND LEMONIER, carmine-red, marked with cream-colour; RUBRUM METALLICUM, reddish, with a bluish suffusion, and coppery-red margin; SOUVENIR DE DR. BLEU, crimson centre, edged green, large and handsome; SOUVENIR DE MADAME BERNARD, crimson centre, spotted green and white, margined green.

CALAMUS. All the 200 species of this genus inhabit tropical or sub-tropical regions; they are mostly found in Eastern Asia. To those described on page 235, Vol. I., the following should now be added:

C. guineënsis (Guinea). *l.* pinnate; segments narrow-lanceolate, supported by spiny leafstalks; young ones cinnamon-brown, changing to deep green. Sikkim, 1884.

C. kentiæformis (Kentia-shaped). "The habit of the plant recalls at once the form and character of *Kentia Forsteriana* [*Howea Forsteriana*], from which circumstance its name was given" (Catalogue of the Compagnie Continentale d'Horticulture, 1884, p. 3). No further description given.

C. Lindeni (Linden's). *l.* pinnatifid; pinnæ unarmed, lanceolate, flat, three-nerved, acuminate, attenuated at base, white-pruinose beneath; petioles and sheaths prickly, the prickles straight, long, brown, thickened at base. Caudex thickened, cylindrical. Indian Archipelago, 1883. (I. H. 1883, 499.)

C. regis (royal). *l.* shining green, borne on mealy petioles. 1886. An elegant and graceful Palm.

C. spectabilis (remarkable). *l.* slender, pinnate; pinnæ about five on each side the rachis, not equidistant, oblong, five to seven-nerved, convex above; petioles very short. 1886. A small-growing, somewhat spiny species, of graceful habit, suitable, when in a young state, for table decoration.

C. trinervis (three-nerved). *l.* pinnate; leaflets alternate, lanceolate, sessile, acuminate, having three prominent, hairy nerves, and two marginal and two intermediate ones less developed; transverse veins conspicuous; petioles thorny, clothed with a deciduous, scale-like tomentum, the sheath ending in a fringe of pointed, brown scales. East Indies, 1883.

CALANTHE. About forty species, mostly natives of tropical Asia, are comprised in this genus. To those described on pp. 236-7, Vol. I., the following should now be added:

C. anchorifera (anchor-bearing). *fl.* whitish-ochre; sepals oblong, apiculate; petals very small, rhomboid, obtuse-angled; lateral segments of the lip ligulate, retuse, antrorse, the anterior one bilobed and bent like an anchor; spur filiform; bracts short, velvety; peduncle hairy. Polynesia, 1883.

C. bella (beautiful). *fl.* disposed in long, arched racemes, as large as those of *C. Turneri;* sepals white; petals blush; lip blush-pink, broad, deeply four-lobed, with a deep carmine-crimson blotch surrounded by white; column dark crimson; spur pale yellow. Pseudo-bulbs as in *C. vestita.* 1881. A hybrid between *C. Turneri* and *C. Veitchii.*

C. bracteosa (bracted). *fl.* white; sepals and petals cuneate-oblong, apiculate; lip with a short isthmus, linear acute lateral segments, and a broader anterior one; spur filiform; bracts much developed, sometimes exceeding the flowers. Samoa, 1882.

C. Ceciliæ (Miss Cecilia Weld's). *fl.* light ochre, with a delicate hue of purple; sepals and petals obovate, acute; lip four-cleft, the lateral segments oblong-ligulate, dilated, the middle one sub-sessile, bifid, the calli very deep yellow; spur slender, filiform. Malayan Peninsula, 1883.

C. colorans (coloured). *fl.* white; sepals and petals oblong, acute; lip changing to ochre, with calli of gamboge-yellow; spur shorter than the pale ovary, generally bidentate at apex; raceme rather dense, elongated, the rachis, bracts, ovaries, and sepals velvety. 1885. (W. O. A. 218.)

C. Curtisii (Curtis'). *fl.*, sepals and petals rosy outside, white inside, the petals and lateral sepals with rosy borders; lip yellow, with a very short, rather triangular, blunt lobe on each side of the base, the middle segment cuneate, dilated from the narrow base, the callus purple; column white and rosy. *l.* long-petiolate, cuneate-oblong, acute. Sunda Islands, 1884.

C. dipteryx (two-winged). *fl.* suffused rich purple; sepals, rachis, bracts, pedicels, and ovaries puberulous outside; basilar partition of the lip triangular, obtuse, short, scarcely reaching half the breadth of the anterior lacinia; callus purple, in three rows; isthmus very short. Sunda Islands, 1884. Allied to *C. pleichroma.*

Calanthe—*continued.*

C. Forstermanni (Förstermann's). *fl.*, sepals and petals yellow, oblong, acute; lip whitish-yellow, reniform, with an apiculus; spur clavate, half the length of the stalked ovary; bracts rather thin, exceeding the flowers; peduncle distantly sheathed, densely racemose at apex. *l.* petiolate, oblong-lanceolate, acute, 3ft. long. Birma, 1883.

C. Langei (Lange's). *fl.* deep yellow, numerous, crowded; dorsal sepal ovate, acute, the lateral ones lanceolate; petals ovate, acute; lip spathulate-obovate, apiculate, with minute, deltoid side lobes, and two slight elevations at the base; raceme 3in. to 4in. long; scape shorter than the leaves. *l.* lanceolate, 2ft. long, 2½in. broad. New Caledonia, 1885.

C. lentiginosa (freckled). *fl.* white; sepals hairy outside; lip well developed, four-lobed, much plaited, having three blunt keels, and numerous purple spots, the basilar lobes turned over so as to form a cover inside; spur long, antrorse, curved, hairy. Pseudo-bulbs obpyriform. 1883. Hybrid.

C. natalensis (Natal). *fl.* 1in. to 1½in. in diameter, pale lilac, with a darker, redder lip, or with the sepals and petals white and suffused with lilac towards the margins only; sepals ovate-lanceolate, acuminate; petals shorter and broader; lip about as long as the sepals; raceme 6in. to 8in. long; scape longer than the leaves, erect. *l.* five to seven, all radical, 8in. to 12in. long, 3in. to 5in. broad, elliptic-lanceolate. Natal. (B. M. 6844.)

C. porphyrea (porphyry-colour). *fl.* in a zigzag raceme; sepals and petals dazzling purple, oblong, acute; lip yellowish at base, with small, purple spots, three-lobed, the side lobes involved, the anterior one purple, emarginate, protruded; spur ochre, nearly equalling the stalked ovary: peduncle hairy. Pseudo-bulbs constricted, fusiform. 1884. Hybrid.

C. proboscidea (snout-like). *fl.* white, changing to lightest ochre, with a few vermilion markings on the lip, the short nail of which descends and the large blade stands at right angles with it, having four laciniæ; anterior part of the column curved down, like the snout of some insects Sunda Islands, 1884. Allied to *C. furcata.*

C. Regnieri (Regnier's). *fl.* eight to ten, about 2in. across; sepals white, recurved; petals white, with a faint rosy, central stripe; lip elbowed or inflexed near the base so as to project forwards, three-lobed, lively rose-pink, with a deep crimson, central spot; spur recurved, about 1in. long; scapes woolly, 1½ft. to 2ft. high, with large bracts. Pseudo-bulbs leafless, large, with a contracted mouth. Cochin China, 1883.

C. R. fausta (lucky). A fine variety, having the column and base of the lip of the darkest and warmest purple. 1884.

C. rosea (rosy). *fl.* pale rose, shading to white on the lip, which is oblong, flat, retuse; spur straight, obtuse, horizontal; column tomentose; bracts recurved, shorter than the ovary; scape many-flowered, longer than the leaves. *l.* oblong-lanceolate, plicate, glabrous. Pseudo-bulbs fusiform. Moulmein. SYN. *Limatodes rosea* (B. M. 5312; P. F. G. iii. 81).

C. Sanderiana (Sander's). *fl.* disposed in strong, many-flowered spikes; sepals and petals rosy; lip rosy-crimson, similar to that of *C. Regnieri.* Spring. Cochin China. Allied to *C. Veitchii.*

C. Sandhurstiana (Sandhurst's). A charming hybrid, similar to *C. Veitchii*, but having much deeper-coloured flowers. 1884.

C. sanguinaria (bloody). *fl.* dazzling blood-red, the acuminate sepals and the lip being lighter, with blood-red markings, outside pale purple; petals broader than the sepals; middle lobe of lip cuneate, dilated, bilobed; raceme hairy. Pseudo-bulbs hexagonal. 1886. A handsome, seedling form.

C. Sedeni (Seden's). *fl.* large; sepals and petals bright rose; lip the same colour, with a very dark purplish blotch, surrounded by a zone of white, at the base. A hybrid between *C. Veitchii* and *C. vestita rubro-oculata.*

C. Stevensii (Stevens'). *fl.* white (changing to buff as they become older), with a rosy-purple spot on the lip; scape erect, hairy, eight to ten-flowered. Bulbs greyish, stout-jointed. Cochin China, 1883. A pretty species.

C. Turneri (Turner's). *fl.* pure white, with a deep rose eye, resembling those of *C. vestita*, but more compact, and produced in larger and longer spikes that in that species. Pseudo-bulbs jointed. Java.

C. T. nivalis (snowy). *fl.* wholly white. Birma.

C. veratrifolia macroloba (large-lobed). *fl.* pure white, larger and of greater substance than in the type; basilar lobe very broad; lateral calli much developed. May and June. Pacific Islands.

C. v. Regnieri (Regnier's). *fl.* pure white, with a light ochre lip; lateral laciniæ of the lip divaricate, nearly semi-lunate. Cochin China, 1887.

C. vestita luteo-oculata (yellow-eyed). *fl.* white, with a blotch of yellow in the middle of the lip. October to February. (F. d. S. 816; L. J. F. 333; P. M. B. xvi., p. 129; W. S. O. i. 29, upper fig.)

C. v. oculata-gigantea (giant-eyed). *fl.* white, handsome, about 3in. in diameter, with a fiery-red blotch on the base of the lip, the under side of the base and the much-curved spur orange; raceme hairy. Borneo, 1886. (W. O. A. 211.)

Calanthe—*continued.*

C. v. Williamsii (Williams'). *fl.*, sepals and petals white, striped and edged with rosy-crimson; lip bright magenta-crimson. 1884. A showy variety. (W. O. A. iii. 134.)

CALCEOLARIA. This genus embraces nearly 120 species, natives of Western America. Two are also found in New Zealand. To those described on pp. 239-40, Vol. I., the following should now be added:

C. Sinclairii (Dr. Sinclair's). *fl.* in loose, sub-corymbose heads; corolla pale lilac or flesh-coloured externally, spotted reddish-purple within, ¼in. to ½in. in diameter, between hemispherical and campanulate. June. *l.* membranous, long-petiolate, 2in. to 4in. long, oblong or ovate-oblong, crenate-toothed or lobulate. New Zealand, 1881. A straggling, half-hardy herb. (B. M. 6597.)

Varieties. The yearly improvement in the Calceolaria consists in the production of improved strains from seeds. The improvements are as follow: Plants of a dwarfer habit, a much larger quantity of blossom from a plant, and the flowers themselves richer and more varied in colour, larger in size, and much better formed. When a variety of a distinct colour has been obtained, and its qualities are such that it may fairly be considered a good advance on existing varieties, seeds are saved from it; and if it has been kept free from the influence of foreign pollen, the seedlings can be depended upon to be much like the parent. In this way strains of distinct colours are obtained. Named collections are not to be had, as the expense of propagating them from cuttings or offsets is too much to compensate the growers. The plants can be propagated during the summer months most surely by layering, while placed in hand-lights or frames on the north side of a wall or fence. From six to a dozen plants may be obtained from one old stool during summer. Cuttings will strike in sandy soil if they are placed in closed hand glasses.

CALIMERIS. Included under **Aster** (which *see*).

CALLIANDRA. Of the eighty species of this genus, one is a native of the East Indies, and the rest are all tropical or sub-tropical American. To those described on p. 242, Vol. I., the following should now be added:

C. tergemina (threefold). *fl.* white, disposed in globose heads; filaments tipped red. Spring. *l.* pinnate, grey-green. Branches zigzag. Tropical America, 1887.

CALLIRHOË. Seven species of this genus are known. Calyx five-cleft; petals purplish, pink, or white, cuneiform-truncate and often fimbriate-denticulate. Leaves mostly lobed or parted. To the species described on p. 243, Vol. I., the following varieties should now be added:

C. involucrata linearifoba (linear-lobed). *fl.*, petals lilac in the centre, margined white on each side, broad, obcuneate. *l.* pedato-partite, dark green, roundish in outline, cut in a bipinnatifid manner almost to the base into narrow lobes ¼in. wide. Stems numerous, trailing. Texas, 1884.

C. pedata compacta (compact). A compact, garden variety, having flowers of a delicate blush. 1887. (R. G. 1224.)

CALOCEPHALUS (from *kalos*, beautiful, and *kephale*, a head; alluding to the inflorescence). Including *Leucophyta.* ORD. *Compositæ.* A genus embracing about ten species of greenhouse, usually cottony or woolly, annual or perennial herbs, rarely sub-shrubs or small shrubs, natives of Australia. Flower-heads numerous and usually more or less stipitate on a small and branching or globose or conical receptacle, in an ovoid or globular, dense cluster or compound head, without any involucre, or surrounded by a few bracts rarely exceeding the florets; partial heads two or more-flowered; receptacle without scales; florets five-toothed. Leaves alternate or (in two species) opposite, entire. *C. Brownii* is the only species grown in our gardens. It is much used in carpet-bedding arrangements, and thrives in almost any soil. Propagation may be effected by means of cuttings, inserted under a bell glass, in a cool greenhouse or frame, and wintered in any light, dry structure, free from frost.

C. Brownii (Brown's). *fl.* in globular clusters four to six lines in diameter, surrounded by a few floral leaves. *l.* alternate, linear, obtuse, two lines or less in length. *h.* 1ft. A rigid, woolly-tomentose shrub. SYN. *Leucophyta Brownii.*

CALOCHORTUS. Baker enumerates twenty-one, and S. Watson thirty-two, species of this genus, natives of North (mostly Western) America, extending as far as Mexico. To the varieties of *C. venustus* described on p. 245, Vol. I., the following should now be added:

C. venustus roseus (rose-coloured). *fl.* white inside, with a distinct, red spot on each segment, purplish-rose outside. *l.* short, bluish-green. 1886.

CALOPHACA. About seven species of greenhouse or hardy, perennial herbs, shrubs, or under-shrubs, natives of Asiatic Russia, the Orient, and the Western Provinces of India, are included in this genus. Flowers yellow or violet, few, rather large. Leaves impari-pinnate; leaflets entire, exstipellate. *C. grandiflora* is a hardy, branched shrub, requiring similar culture to that recommended for *C. wolgarica* on p. 245, Vol. I.

C. grandiflora (large-flowered). *fl.*, calyx five-cleft; corolla golden-yellow, papilionaceous, 1in. long; peduncles axillary, and, together with the raceme, exceeding the leaves. June and July. *l.* 2½in. to 8in. long; leaflets ovate, shortly petiolulate, ½in. to nearly 1in. long, entire. 1886. (R. G. 1231.)

CALOPOGON. This genus comprises four closely-related species of hardy, terrestrial Orchids, natives of North America. To those described on p. 246, Vol. I., the following should now be added:

C. multiflorus (many-flowered). *fl.* amethyst-purple; stalk of the lip having on each side of the base an auricle, the broad, irregularly square, retuse, emarginate, anterior blade having at the base a tuft of golden-yellow, hairy lamellæ, often purplish at base, and before these some purple calli; peduncle five-flowered. 1884.

CALYPTROGYNE. This genus comprises six or eight species, natives of tropical America. Spadices simple or branched from the base, long-pedunculate; spathes two, narrow, the lower one much shorter than the peduncle, cleft at apex, the upper one deciduous, elongated, cleft the whole length. Fruit small, oblong or obovoid, one-seeded. Leaves terminal, unequally pinnatisect; segments in few pairs; petioles very short. To the species described on p. 249, Vol. I., the following should now be added:

C. teres (terete). *l.* spreading or drooping, consisting, in young plants, of two pairs of linear-oblong, tapered leaflets about 2in. wide, bright green, with the principal ribs raised; petioles terete. British Guiana. Stove.

CAMELLIA. New varieties of *C. japonica* are not very numerous, but recent additions from America have greatly improved our collections, and some more recent Italian forms are worth adding to the most select collections. The best are contained in the following list:

CARLOTTA PAPUDOFF, beautifully marked on a rose-coloured ground, good form; COMTE NESSELRODE, pale rose, shading to white at the margin, large, imbricated; GIARDINO FRANCHETTI, rose-coloured, lightly marbled, large, and well shaped; GIARDINO SANTARELLI, crimson, blotched white; GIOVANNI SANTARELLI, deep red, blotched white, large, and well imbricated; IMPERATRICE EUGENIE, rose, shading to white at the margin, finely formed; LEOPOLD I., crimson, fine form; L'INSUBRIA, rose, lightly marked with white, well imbricated, medium sized; MADAME CACHET, white, blotched red, fine form; MONARCH, rich scarlet, large, of good form; OCHROLEUCA, cream-colour; RETICULATA, clear rose, large; RETICULATA FLORE-PLENO, deep rose, large; TRICOLOR, white, striped deep red, semi-double; TRIOMPHE DE LODDI, blush, striped rose; TRIOMPHE DE WONDELGHEM, deep pink.

CAMPANULA. About 230 species have been referred to this genus; they are broadly dispersed over the Northern hemisphere, being very copious in the Mediterranean region. Calyx tube adnate, the limb deeply five-cleft or five-parted; corolla campanulate, rarely funnel-shaped or sub-rotate, short, five-cleft to the middle or rarely nearly to the base; stamens free of the corolla, the filaments often dilated at base, the anthers free. To the species described on pp. 253-8, Vol. I., the following should now be added:

C. abietina (Fir-like). *fl.* light blue; spikes loose, branching. July and August. Stems slender, 9in. to 15in. high. Eastern Europe. Plant tufted.

C. garganica hirsuta (hairy). *fl.* very profuse; sepals rather longer and somewhat narrower than in the type; corolla purplish-blue, pale towards the base, saucer-shaped. *l.* (as well as the stem) densely covered with longish, stiff, white hairs. Flowering branches longer and slenderer than in the species. Habit dwarf, and more trailing. An excellent plant for hanging baskets, flower-boxes, brackets in corridors, &c.

C. Grosseckii (Grosseck's). *fl.* violet, large, campanulate, disposed in a long raceme. *l.* large, cordate-lanceolate, acuminate, the margins coarsely toothed. Stems leafy, 2½ft. high, branching at base. Eastern Europe, 1886. A handsome plant. (R. G. 1886, p. 477, f. 55.)

C. Jacobæa (St. James's). *fl.* axillary, on curved pedicels 1½in. to 2½in. long; calyx segments narrow-lanceolate, ½in. to ⅝in. long; corolla deep blue or pale greenish, campanulate, 1in. to 1½in. long. March. *l.* 1½in. to 2½in. long, sessile or nearly so, oblong-ovate or obovate-oblong, obtuse or sub-acute, narrowed at base; upper ones cordate, half-amplexicaul. *h.* 2ft. to 3ft. Cape de Verde, 1882. Half-hardy under-shrub. (B. M. 6703.)

C. sibirica eximia (choice). *fl.* varying from pale bluish to violet, narrow-campanulate; stem much branched. *l.* long, scabrous. Europe, &c., 1883. Habit dwarf and compact.

C. Tenorei (Tenore's). A neat, dwarf species, much resembling *C. pyramidalis* in its flowers and foliage, but not exceeding 1ft. in height.

CANARIUM. This genus embraces about fifty species, mostly natives of tropical Asia; a few are indigenous in Africa and the Mascarene Islands, and one is found in Australia. To the species described on p. 259, Vol. I., the following should now be added:

C. vitiense (Fijian). *fl.* yellowish-white, small, paniculate. *fr.* bluish-black. *l.* pinnate; leaflets five to seven, oblong-elliptic, obtuse. Fiji, 1887. A small tree.

CANNA. Nearly thirty species, all tropical or sub-tropical American, are included here. To those described on p. 262, Vol. I., the following should now be added:

C. grandiflora picta (large-flowered, painted). *fl.* yellow, spotted with red. 1885. A handsome and robust, garden variety. (R. H. 1885, p. 396.)

C. liliiflora (Lily-flowered). *fl.* 4in. to 5in. long, Honeysuckle-scented, in a short, terminal raceme; perianth tubular, the three outer petaloid lobes linear-oblong, convolute, reflexed, tinged green, the three inner ones straight and extended, recurved at end, white, tinted yellowish-green. *l.* large, Musa-like, oblong, acuminate. Stems stout, erect. *h.* 6ft. to 10ft. A fine plant. (F. d. S. 1055-6; R. H. 1884, 132.)

C. rosæflora (rose-flowered). *fl.* magenta-red. 1885. Garden variety. (R. H. 1885, p. 396.)

CAPE POISON BULB. *See* **Buphane disticha.**

CARAGANA. This genus embraces about fifteen species, natives of Asiatic Russia and the Himalayas. To those described on pp. 264-5, Vol. I., the following variety should now be added:

C. arborescens pendula (pendulous). This only differs from the type in having the branches pendulous. 1887. SYN. *C. pendula.*

C. pendula (pendulous). A variety of *C. arborescens.*

CARAGUATA. The species of this genus number nearly a score, and are found in the West Indies, Central America, and Colombia. Flowers clustered; sepals erect, imbricated, often shortly connate at the base; petals deeply connate in a tube, the free part spreading; anthers nearly sessile at the apex of the staminal tube; inflorescence dense, terminal. Leaves entire. To the species described on p. 265, Vol. I., the following should now be added:

C. Andreana (Andre's). *fl.* about 2in. long, numerous; calyx and corolla bright yellow; panicle spike-like, rather lax, longer than the leaves; stem and bracts carmine-rose. *l.* arching, green, 2ft. long, 2in. broad, forming a lax rosette. Andes of Pasto, 1884. (B. M. 7014; R. H. 1884, p. 247, f. 61; 1886, p. 276.)

C. angustifolia (narrow-leaved). *fl.* large, few in a dense spike; calyx whitish, the segments oblong, acute; corolla yellow, the tube cylindrical, 2in. long; bracts red, large, oblong-lanceolate; peduncle short, with a few reduced leaves. *l.* in a dense rosette, 6in. long, lanceolate, channelled from the ovate base to the attenuated apex. 1884. SYN. *Guzmannia Bulliana.*

C. cardinalis (scarlet). *fl.* white, sessile in the midst of the bracts; scape 1ft. to 1½ft. high, surmounted by a crown of brilliant scarlet bracts, tipped with green, the innermost ones yellow. *l.* 1½ft. long, lingulate, recurving. Columbia, 1880. This very handsome decorative plant retains its brilliant colour for a very long time. (R. H. 1883, p. 12.) SYN. *C. lingulata cardinalis* (I. H. 374).

Caraguata—*continued.*

C. lingulata cardinalis (scarlet). A synonym of *C. cardinalis.*

C. Morreniana (Morren's). *fl.* yellow, in a large, compact head; bracts bright red; flower-stem 4in. to 6in. long. *l.* rosulate, 16in. to 20in. long, 2in. broad, with recurved, acuminate tips; outer ones dark green, gradually passing, by being shaded and tinted with violet, into the violaceous floral ones. Rio Cuiaquer, New Grenada, 1887. (R. H. 1887, p. 12.)

C. musaica (mosaic). (B. M. 6675.) The correct name, according to Baker's classification, of the plant described by Morren under name of **Massangea musaica** (which *see*, on p. 335, Vol. II.).

C. Osyana (Baron Edouard Osy's). *fl.* axillary, solitary, shorter than the bracts; corolla yellow, twice as long as the calyx, clavate-tubular, sub-arcuate, the tube elongated, the lobes erect; bracts orange-salmon, imbricated, reflexed; spike compact, strobiliform. *l.* coriaceous, 1½ft. long, lanceolate, somewhat channelled. Stem erect, short, robust. Ecuador, 1885. (B. H. 1885, 16-17.)

C. Peacockii (Peacock's). *fl.* white; stem covered with bright purple bracts, the upper ones rolled round the flowers. *l.* bronzy-purple above, rosy-purple beneath, forming an ample rosette. 1885.

C. sanguinea (blood-coloured).* *fl.* clustered at the base of the centre of the rosette of leaves; corolla 2½in. to 3in. long, the tube yellowish-white, long, clavate, the three segments white, ovate. November. *l.* in a dense rosette, lanceolate, acute, falcate, thin, the lower part green, the upper half or two-thirds strongly tinged with bright red on both sides, the outer leaves 1ft. or more in length. New Grenada, 1880. Plant stemless. (B. M. 6765.)

CAREX. Upwards of 800 species have been referred to this genus, but probably not more than 500 are entitled to rank as such; they are copiously dispersed over temperate and frigid regions, but few being found within the tropics, and those on mountains. To those described on p. 267, Vol. I., the following should now be added:

C. scaposa (scapose). *fl.* brownish; spikelets ⅛in. to ¼in. long; cymes three or more to a scape, 1in. to 2in. broad; scapes longer or shorter than the leaves, stout, erect. Winter. *l.*, radical ones 1ft. long or more, 2in. broad, elliptic-lanceolate, acuminate at both ends; petioles sometimes 3in. to 4in. long. South China, 1883. Greenhouse. (B. M. 6940.)

CARLUDOVICA. This genus embraces about thirty species, natives of tropical America and the West Indies. To those described on p. 268, Vol. I., the following should now be added:

C. Plumieri (Plumier's). *fl.*, spadices pendulous, 4in. long, axillary, pedunculate, covered with twisted threads. *l.* alternate, bipartite, the divisions lanceolate, plicate, with ribs raised on the upper surface, bright green above, paler beneath. Caudex erect, waving.

CARMICHÆLIA. New Zealand is the headquarters of the nine species embraced in the genus. To the one described on p. 269, Vol. I., the following should now be added:

C. Mulleriana (Muller's). *fl.* whitish, striated purple, small, solitary or in pairs in the axils of the leaves. *l.*, leaflets one to three, small, obovate, emarginate, about ¼in. long, on a rather longer petiole. Branches slender, compressed, pinnately branched; branchlets filiform, compressed. *h.* about 2ft. 1887.

CARNATION. All the sections of the Carnation are immensely popular, and have been greatly improved during the last year or two. The Self-coloured varieties have been more in demand during the season 1887-8 than the Bizarres and Flakes. A few additions in these classes are as follows:

Scarlet Bizarres. DREADNOUGHT (Daniels), GEORGE (Dodwell), JAMES MCINTOSH (Dodwell), ROBERT HOULGRAVE (Barlow), ROBERT LORD (Dodwell).

Crimson Bizarres. ALBION'S PRIDE (Headley), HARRISON WEIR (Dodwell), H. K. MAYOR (Dodwell), ROBERT SCOTT (Scott), THE LAMPLIGHTER (Wood).

Pink and Purple Bizarres. MRS. GORTON (Dodwell), SIR GARNET WOLSELEY (Turner), SQUIRE LLEWELLYN (Dodwell), TWYFORD PERFECTION (Young), UNEXPECTED (Turner), WILLIAM SKIRVING (Gorton).

Purple Flakes. FLORENCE NIGHTINGALE (Sealey), SPORTING LASS (Fletcher), SQUIRE MEYNELL (Brabbin), SQUIRE WHITBOURN (Dodwell).

Rose Flakes. JOHN KEET (Whitehead), MRS. BRIDGEWATER (Bridgewater), MRS. ERSKINE (Dodwell), SYBIL (Holmes), THALIA (Douglas).

Scarlet Flakes. ALISEMOND (Douglas), FLIRT (Turner), HENRY CANNELL (Dodwell), MATADOR (Abercrombie), SPORTSMAN (Hedderley).

Carnation—*continued.*

Clove Carnations and Selfs. AMBER (Maunder), amber-coloured; BRIDE (Hodges), fine white; COMTE DE CHAMBORD, flesh-white; CREMORNE (Turner), light purple; DUCHESS OF CONNAUGHT (Abercrombie), pure white; EDITH (Finlinson) bright yellow; EUPHROSYNE (Dodwell), rose; FLORENCE (Wallington), buff; IMPERIAL PURPLE (Abercrombie), rich purple; MRS. REYNOLDS HOLE (Nowell), terra-cotta colour; PRIDE OF PENSHURST (Bridger), yellow; PURPLE EMPEROR (Douglas), bright purple; ROSE CELESTIAL (Douglas), rose SCARLET GEM (Douglas), brilliant scarlet; THE GOVERNOR (Cross), blush white; WILL THRELFALL (Threlfall), yellow.

TREE OR PERPETUAL. The following Tree Carnations have all, with the exception of MRS. KEEN, been raised by Mr. Charles Turner in the Royal Nurseries, Slough, and are indispensable to all good collections:

A. H. KENNEDY, bright scarlet; AMETHYST, crimson-scarlet; BLACK DIAMOND, dark maroon; CLEOPATRA, deep rose; COLONEL COX, vivid scarlet; COLOUR-SERGEANT, very bright scarlet; CORONET, rich scarlet, large; COSSACK, dark crimson; COUNTESS HOWE, pale buff, splashed pink; MADELEINE, delicate pink; MONT BLANC, pure white; MRS. KEEN (Veitch), dark crimson; MRS. LLEWELYN, deep rose; MRS. OLDACRE, bright rose; MRS. W. H. GRENFELL, salmon-pink; NOVELTY, silvery-white, striped crimson; PHYLLIS, white ground, edged scarlet; PURPLE KING, large, bright purple; RISING SUN, intense scarlet ROSETTA, bright rose.

CARREGNOA. A synonym of **Tapeinanthus** (which *see*).

CARYOTA. About a dozen species are included here; they inhabit tropical Asia, the Malayan Archipelago, New Guinea, and tropical Australia. To those described on pp. 274-5, Vol. I., the following should now be added:

C. plumosa (feathery). A species supposed to be newly introduced, and distributed by a Belgian firm without description or information as to origin.

CASSIA. The species of this genus are broadly distributed over the warm regions of the globe. To those described on p. 276, Vol. I., the following should now be added:

C. coquimbensis (Coquimbo). *fl.* 1½in. in diameter; sepals oblong, obtuse, about half the length of the orange-yellow petals; dorsal petal obcordate, the two lateral ones broadly obovate, the anterior ones smaller, obovate-oblong; cymes axillary, many-cleft, sub-corymbose. September. *fr.*, pods about 4in. long, over ½in. broad, stipitate, flattened, acute at base, mucronate at tip. *l.* 2in. to 4in. long; leaflets four to six pairs, four to eight lines long, sessile, elliptic-oblong or almost rounded, apiculate, pale green. Chili, 1886. Greenhouse shrub. (B. M. 7002.)

CATALPA. About half-a-dozen species are embraced in this genus; they are found in China, Japan, North America, and the West Indies. To the species described on pp. 278-9, Vol. I., the following variety should now be added:

C. bignonioides foliis-argenteis (silvery-leaved). *l.* silvery-variegated. 1887. Garden variety. A variety with purplish leaves has originated in the United States.

CATASETUM. This genus comprises nearly forty species, natives of tropical America, extending from Brazil as far as Mexico. Lip fleshy, sessile at the base of the column; pollen masses four. To the species and varieties described on pp. 279-80, Vol. I., the following should now be added:

C. Bungerothi (Bungeroth's).* *fl.* white, very showy; sepals and petals lanceolate, very acute, spreading; lip large, transversely oblong, deeply concave, shortly and obtusely spurred, bidentate at apex; racemes many-flowered. *l.* lanceolate, very acute, 8in. to 9in. long, 1½in. to 2in. broad. Pseudo-bulbs fusiform, 5in. to 9in. long. Equatorial America, 1887. (B. M. 6998; G. C. ser. iii., i., p. 142; I. H. ser. v. 10.)

C. B. aureum (golden). *fl.* light yellow. Venezuela. A distinct variety.

C. B. Pottsianum (Potts'). *fl.*, petals prettily marked with purple; centre of the lip having a few spots. 1887.

C. Christyanum (Christy's). *fl.* large, spreading, each with a narrow bract at base; sepals dark reddish- or chocolate-brown, the dorsal one erect, the lateral ones spreading; petals lighter brown, pale-spotted at base; lip green and purplish, short, with a bluntly conical, saccate pouch and a three-lobed limb, the lateral lobes with long, purple fringes; raceme erect, six-flowered. Autumn. *l.* lanceolate-lorate, acuminate, plaited. Stems fusiform, jointed, 6in. to 8in. long. Amazons. (W. O. A. 83.)

C. C. obscurum (obscure). *fl.*, sepals and petals blackish-purple; side lobes of the lip dark, rich purple, the middle lobe

Catasetum—*continued.*

brownish-olive-green, and the wall around the mouth of the apex light ochre, marked with red. 1885.

C. costatum (ribbed). *fl.*, sepals and petals yellowish; side lobes of the lip erect, triangular, the upper border ciliated; "the mid-lobe . . . . goes out into a low, blunt, small triangle, standing over the long, blunt conus, so very remarkable by the presence of some lighter ribs running at each side, but which are not very conspicuous as long as the lip is fresh" (Reichenbach). 1887.

C. cristatum stenosepalum (narrow-sepaled). *fl.*, sepals purplish-brown, narrow; petals entire, purple, striated with dark purple. 1887. (I. H. ser. v. 71.)

C. fimbriatum (fringed). *fl.* yellowish-green; sepals linear, apiculate; petals rather longer, fleshy; lip fleshy, three-lobed, the lobes fringed with long, mostly bifid fimbriæ; scape about nine-flowered. *l.* lanceolate, acuminate, slightly plicate. Pseudo-bulbs about 6in. long, six to eight-leaved. Pernambuco. (B. M. 3708.)

C. f. viridulum (greenish). *fl.*, sepals and petals green, spotted reddish-purple; column greenish-white, spotted with purple. 1886.

C. galeritum (fur-capped). *fl.* rather large; sepals and petals pale green, spotted brown, oblong, acute; lip pale green, saccate, oblong, conical at apex, ochreous in front, marked pale green around the mouth, and marked brown on a yellow ground inside; raceme several-flowered, lax. Columbia (?), 1886.

C. glaucoglossum (glaucous-lipped). *fl.* large; sepals brown, ligulate, acute; petals glaucous, spotted brown, much larger than the sepals, oblong, acute; lip glaucous, spotted brown inside, having a depressed, rounded sac, and a triangular mouth; raceme stout, bearing several flowers, deflexed. Mexico, 1885. A curious species.

C. Lehmanni (Lehmann's). *fl.* in a loose, drooping raceme; sepals and petals green, equal, ovate, acute, connivent in a globe; lip yellowish-flesh-colour, semi-orbicular-saccate, trilobed. *l.* narrow-lanceolate. Columbian Andes, 1886. A curious, but by no means beautiful, species. (R. G. 1223, a-g.)

C. pilcatum (capped). *fl.* white, rather large; sepals narrow-oblong, acute; petals broadly oblong, acute; lip large, broadly triangular, with a bluntly conical spur; column with a very long beak. 1886.

C. sanguineum (bloody). *fl.* greenish, speckled with brown or dull red, not at all handsome, disposed in a close raceme; sepals and petals turned upwards; lip lacerated, except at the base. October and November. *l.* light glaucous-green. Pseudo-bulbs 6in. to 7in. long. Central America, 1850.

C. s. integrale (entire). *fl.* having the anterior lip wholly entire. 1887.

C. tabulare serrulata (serrulated). *fl.* green, yellowish-white, and blush-white, the side margins of the lip serrulated. 1886. (R. G. 1223, h-m.)

C. tapiriceps (tapir-headed). *fl.* numerous; sepals green; petals brown; lip orange, trigono-sacciform, the free margin toothleted, the side laciniæ revolute, the middle one with a transverse, emarginate keel not far from the margin; column resembling "a Malayan tapir, with its curved trunk." Brazil, 1888.

C. tridentatum bellum (pretty). A variety having purplish-brown sepals, and a large, purplish-brown blotch on either side the lip. Brazil, 1886.

C. Trulla (trowel-shaped). *fl.* green and brown; sepals and petals spreading, oval, flat; lip much the shape of a trowel, not at all hollowed out into a bag, but merely concave like the bowl of a spoon, the edges fringed; column short, tendrilled. South America, 1810. (B. R. xxvii. 34.) The variety *sub-inberbe* has no fringe to the lip. 1887.

C. T. maculatissimum (much-spotted). *fl.*, sepals, petals, and the anterior part of the sides of the column covered with brown spots; anterior side of the lateral lobes of the lip having well-developed fringes. 1888.

CATTLEYA. The species of this genus are all natives of the warmer parts of America, from Brazil to Mexico. The following corrections of, and additions to, the information given on pp. 280-4, Vol. I., are based upon the monograph of the genus recently published by Messrs. James Veitch and Sons, in Part II. of their "Manual of Orchidaceous Plants."

C. alba (white). A form of *C. Luddemanniana.*

C. amabilis (lovely). A synonym of *C. intermedia.*

C. Amesiana (Ames'). A synonym of *Lælia Amesiana.*

C. aurea (golden). A variety of *C. Dowiana.*

C. autumnalis (autumnal). A garden synonym of *C. Bowringiana.*

C. bicolor Wrigleyiana (Wrigley's). *fl.*, sepals and petals greyish-green; lip dark purple. 1885.

C. Bluntii (Blunt's). *fl.* resembling those of *C. Mendelii* in shape; sepals and petals white; lip white, stained yellow in the throat. Summer. *l.* (and general habit) as in *C. Mendelii.* Colombia.

Cattleya—*continued.*

C. Boissieri (Boissier's). *fl.*, sepals and petals soft rosy-lilac; lip broad, with a beautiful, curving, yellow blotch extending halfway down and nearly across it. *l.* oblong, short and broad. New Grenada.

C. Bowringiana (Bowring's). *fl.* rich rosy-purple, about 2½in. in diameter, the front of the lip deep purple, with a transverse, maroon band, behind which the tube is whitish; raceme corymbose, five to ten-flowered. Autumn. Central America, 1886. A charming species, allied to *C. Skinneri.* SYN. *C. autumnalis* (of gardens).

C. Brabantiæ (Duchess of Brabant's). *fl.* rather large; sepals and petals rose, blotched blackish-purple; lateral lobes of the lip white, curved over the broad, rose-coloured column, the front lobe magenta-purple, obtusely reniform. *l* ligulate-oblong. Stems terete. A hybrid between *C. Aclandiæ* and *C. Loddigesii.* (F. M. 360.)

C. brilliantissima (most brilliant). A garden synonym of *C. Luddemanniana brilliantissima.*

C. Brymeriana (W. E. Brymer's). *fl.*, sepals and petals rosy-purple; lip unusually broad, the side laciniæ blunt-angled, the middle one projecting, obcordate, the mid-area orange, the margins of the laciniæ purplish-mauve, the parts between the edges and the orange lines rosy, fading to white; column white. 1883. A supposed natural hybrid between *C. superba* and *C. Eldorado.*

C. Brysiana (Brys'). A synonym of *Lælia purpurata Brysiana.*

C. bulbosa (bulbous). A synonym of *C. Walkeriana.*

C. Bullieri (Bullier's). A trifling form of *C. Trianæ.* (R. H. 1886, p. 444.)

C. calummata (hooded). *fl.* resembling those of *C. Aclandiæ* in form; sepals and petals whitish, tinted rose and spotted violet; lip having the large side-lobes white, and the wedge-shaped centre, as well as the column, of a rich, velvety violet-red or magenta-rose. *l.* oblong, emarginate, deep green, sometimes spotted with violet. Pseudo-bulbs 3in. to 4in. long. French gardens, 1884. A beautiful hybrid between *C. intermedia* and *C. Aclandiæ.* (R. H. 1883, p. 564; W. O. A. iv. 166.)

C. candida (white). *fl.*, sepals and petals white, shaded pink; lip the same colour, with a dash of yellow in the centre; spike three or four-flowered. July to November. *h.* 1ft. Brazil. Allied to *C. intermedia.*

C. Chamberlainiana (Rt. Hon. Jos. Chamberlain's). *fl.* 5in. in diameter; sepals brownish-purple; petals purple; lip rich purple-magenta; peduncles five to seven or more-flowered. A hybrid between *C. guttata Leopoldii* and *C. Dowiana*, the former of which it closely resembles.

C. chocoënsis. This is now regarded as a variety of *C. Trianæ.*

C. citrino-intermedia (hybrid). *fl.*, sepals and petals dull creamy-white, inclining to flesh-white, the petals a little broader than the sepals; side lobes of the lip flesh-coloured, becoming pale purple at apex, large, rounded, obtuse, the front lobe rosy-purple, nearly truncate, minutely apiculate, with crisped margins; column flesh-white, yellow in front at base; peduncle 2½in. long. *l.* three, 7in. long, 1⅝in. broad.

C. crispa. This is now classed under *Lælia.*

C. crocata (saffron-yellow). A form of *C. Eldorado.*

C. Dawsonii (Dawson's). A synonym of *C. Luddemanniana.*

C. dolosa. This is now regarded as a variety of *C. Walkeriana.*

C. Dowiana. This is now regarded as a variety of *C. labiata.*

C. D. aurea (golden). *fl.* very large; sepals and petals pale yellow; lip rich, deep purple, veined with yellow. Columbia, 1883. A gorgeous variety. (W. O. A. 84.) SYN. *C. aurea* (I. H. 493).

C. Dukeana (Dr. Duke's). *fl.*, sepals light ochre outside, the middle one washed with dull mauve-purple inside, the lateral ones mauve-purple and brownish inside; petals mauve-purple on the disk, smaller; side laciniæ of the lip white and light purple, dolabriform, not quite covering the column, the mid-lacinia light purple, with a narrow, white border; column white, lined purple. 1887. Probably a natural hybrid.

C. Edithiana (Edith's). *fl.* 6in. to 7in. in diameter; sepals and petals light mauve; lip white, striped mauve, the disk buff. *l.* dark green. *h.* 1ft. Brazil. Habit like *C. Mossiæ.*

C. Eldorado. This is now regarded as a variety of *C. labiata.*

C. E. crocata (saffron-coloured). *fl.* broad, white, with a broad, deep orange line running from the base of the lip on the anterior disk, where it expands into a pentagonal blotch, with teeth in front. 1885. SYN. *C. crocata.*

C. E. ornata (adorned). A fine variety, having dark purple tips to the petals. 1884.

C. E. virginalis (virgin-white). *fl.* sweet-scented; sepals and petals snow-white, the former lanceolate, acute, the latter broad, elliptic, obtuse; lip white, with a yellow disk and tube, entire, with a frilled front lobe. August and September. Amazon Country. SYN. *C. virginalis* (I. H. ser. iii. 257). The form *rosea* has a distinct, rosy-purple blotch on the front of the anterior portion of the lip.

Cattleya—*continued.*

C. E. Wallisii (Wallis'). *fl.*, segments white, the orange-yellow disk of the lip reduced in size.

C. exoniensis (Exeter). This is now classed under *Lælia.*

C. fausta (lucky). *fl.*, sepals and petals rosy-lilac; lip white, with a large, yellow disk extending the whole length of the throat, tipped crimson. November. A hybrid between *C. Loddigesii* and *Lælia exoniensis.* (F. M. n. s. 189; G. C. 1873, p. 289.) In the form *radians*, numerous dark purple streaks or bars radiate from the centre of the lip over the anterior part.

C. felix (fruitful). A synonym of *Lælia felix.*

C. Forbesi (Forbes'). *fl.* 3in. to 4in. in diameter; sepals and petals pale yellowish-green, sub-equal; lip three-lobed, the two lateral lobes yellow, sometimes streaked red, convolute over the column, the middle lobe pale yellow, with a broad, bright yellow, central band; column yellow, spotted and stained red; peduncles erect, two to five-flowered. *l.* ovate-oblong, coriaceous. Stems about 1ft. high, two-leaved. Rio de Janeiro, 1823. (B. M. 3265; B. R. 953.)

C. Gaskelliana (Gaskell's). A variety of *C. labiata.*

C. gigas. This is now regarded as a variety of *C. labiata.*

C. g. albo-striata (white-striated). *fl.* smaller than in the type; sepals and petals marked with a distinct, white, central bar or stripe on a blush ground. 1882.

C. g. burfordiensis (Burford). *fl.* more richly coloured and larger than in the type; sepals and petals rose-purple; lip of an intense amethyst, lighter towards the crisped edges, 3in. across. 1882.

C. g. grandiflora (large-flowered). *fl.* remarkably large; sepals and petals rose-pink; lip highly coloured, the upper part white edged with magenta. 1882.

C. granulosa asperata (rough). *fl.*, sepals and petals brownish, spotted dark purple; lip yellowish at base, light vivid purple with a broad white border in front, rough. 1886.

C. g. Russelliana (Russell's). *fl.* larger than in the type, with broader segments; inner side of the lateral lobes of the lip and the claw of the middle lobe orange-yellow, the blade white, spotted with crimson-purple. (B. R. 1845, 59; B. M. 5048, under name of *C. granulosa.*)

C. g. Schofieldiana (Schofield's). *fl.*, sepals and petals greenish-yellow, spotted with crimson, the petals narrow at the base, very broad and obtuse at the apex; lip rich purple, with whitish side lobes, the middle lobe covered with lamellæ and papillæ. *l.* broad, two to a pseudo-bulb. Pseudo-bulbs 1¼ft. high. SYN. *C. Schofieldiana* (W. O. A. ii. 93).

C. guttata immaculata (unspotted). *fl.*, sepals and petals mauve-brown, without spots; lip white, the front lobe purple. 1886.

C. g. Keteleeri (Keteleer's). A synonym of *C. g. lilacina.*

C. g. leopardina (leopard-spotted). *fl.* numerous and handsome; sepals and petals thickly spotted with dark brown; side lobes of the lip white, the broad, bilobed front lobe rich purplish-red; racemes large. Pseudo-bulbs elongated. 1886.

C. g. lilacina (lilac). *fl.*, sepals and petals blush-white, spotted magenta; lip bright magenta-crimson, large and well-fringed. June. Brazil. SYN. *C. g. Keteleeri.*

C. g. phœnicoptera (purple-winged). *fl.*, sepals and petals deep purple; lip whitish. 1885.

C. g. Prinzii (Prinz'). A synonym of *C. amethystoglossa.*

C. g. punctulata (slightly spotted). *fl.*, sepals and petals pale yellowish-green, with but few spots; lip as in *Leopoldii.*

C. g. Williamsiana (Williams'). A variety having purplish, unspotted sepals and petals, and a white lip with a dark purple front lobe. 1884. (W. O. A. v. 212.)

C. Hardyana (Hardy's). *fl.* 6in. to 8in. in expanse; sepals and petals rich rosy-mauve, the former lanceolate, the latter elliptic and wavy; lip deep crimson-magenta, veined on the disk with yellow, and having a large, yellow spot on each side, very large, deeply bilobed and frilled. Columbia, 1885. A magnificent plant, supposed to be a natural hybrid. (W. O. A. v. 231.)

C. Harrisii (Dr. Harris'). *fl.*, sepals and petals amethyst-blue, with numerous purple spots; side lobes of the lip paler than the sepals and petals, with a large, amethyst blotch at the acute apex, the middle lobe amethyst-purple, with a jagged, undulated margin and apical cleft. *l.* 7in. long, 1in. to 2½in. broad. Pseudo-bulbs rather flat, 1in. to 6in. long. 1887. A hybrid between *C. guttata Leopoldii* and *C. Mendelii.*

C. Harrisoniæ (Mrs. Harrison's). This is now regarded as a variety of *C. Loddigesii.*

C. Holfordi (Holford's). A garden synonym of *C. luteola.*

C. hybrida picta (painted hybrid). *fl.* six or seven on each peduncle; sepals pale olive-green, sparingly spotted purple; petals similarly coloured, with the addition of a broad margin of pale rosy-mauve; lateral lobes of the lip white externally, the middle lobe purple, with a paler margin and yellowish disk. A garden hybrid between *C. guttata* and *C. intermedia.* (F. M. 1881, 473.)

Cattleya—*continued.*

C. intricata (intricate). *fl.*, sepals and petals light whitish-rose, narrow; lip like that of *Lælia elegans picta*, only the sharp-angled, long, side laciniæ are white, and the free blade of the mid-lacinia has an abrupt stalk, and is of the deepest, warm purple; column light rose. 1884. Hybrid.

C. iricolor (rainbow-coloured). *fl.* milk-white, with a few purple marks on the lip, 3in. to 4in. across; petals narrower than the sepals; lip obscurely three-lobed, the two lateral lobes convolute over the column; peduncles two or three-flowered. *l.* 1ft. long, strap-like, complicate at base, emarginate at apex. Stems 4in. to 5in. long, one-leaved. Native country unknown.

C. Kimballiana (Kimball's). *fl.* large; sepals and petals of a delicate rosy-white, the former lanceolate, acute, the latter very broad, elliptic, wavy; tube of the lip white outside, with some yellow near the front margins, the inside yellow with some orange lines, the wavy front lobe rich purple on the front part. Venezuela, 1881. A fine species.

C. labiata. The following are now included here as varieties: *Dowiana, Eldorado, gigas, Luddemanniana, Mendelii, Mossiæ, Percivaliana, Trianæ, Warneri,* and *Warscewiczii.*

C. l. Gaskelliana (Gaskell's). *fl.* 7in. across, resembling those of *C. Mossiæ*, but paler; lobes of the lip confluent, crisped, yellow within. Autumn. Brazil. A magnificent plant. (I. H. 1886, 613, under name of *C. Gaskelliana.*)

C. l. leucophæa (dusky-white). *fl.*, sepals and petals blush-white; lip lilac, margined white; throat yellow. Brazil.

C. l. regina (queen). *fl.*, sepals, petals, ovary, and column purple; lip dark mauve-purple, with the usual two lateral, yellow spots. Venezuela. SYN. *C. speciosissima reginæ.*

C. l. Schrœderiana (Baron von Schrœder's). *fl.* white, large; lip marked with broken, mauve-purple lines, and having an orange median line. 1886. A fine variety.

C. l. Wilsoniana (Wilson's). *fl.* of a fine amethyst colour; sepals rather broad and blunt, the petals very much so; lip with a strong fold on each side in front of the centre, the anterior part crenulate and emarginate, marked dark purple. 1887.

C. Lawrenceana (Sir Trevor Lawrence's). *fl.* purplish-lilac, as large as those of a good *C. Trianæ*; sepals uncommonly broad; petals broader than the sepals, usually blunt; lip pandurate, emarginate, rather broader in front than at the base, the anterior part of the darkest, warmest purple, the side wings purple, the centre light yellow. British Guiana, 1885. A fine species. (G. C. n. s., xxiii., pp. 374-5.)

C. L. concolor (one-coloured). *fl.* wholly of a light purple. 1886.

C. L. rosea-superba (superb rosy). *fl.* delicate rosy-purple, striated white, large; sepals paler than the petals and lip; disk of the lip white. The form *oculata* has the central area of the lip buff-yellow, and without a purple band.

C. Lemoniana. This is now regarded as synonymous with *C. labiata.*

C. Lindleyana. This is now classed under *Lælia.*

C. lobata. This is now classed under *Lælia.*

C. Loddigesii candida (white). *fl.* white, with a yellow disk to the lip.

C. L. Harrisoniæ (Mrs. Harrison's). The correct name of the plant described on p. 282, Vol. I., as *C. Harrisoniæ.*

C. L. maculata (spotted). *fl.*, having minute, purple spots extending over the whole surface. Brazil.

C. L. violacea (violet). *fl.* more deeply coloured than in the type.

C. Lucieniana (Lucien's). *fl.*, sepals and petals brown, with a wash of purple; lip rich purple, trifid, with pale yellow side lobes, and red veins and keels. 1885. A beautiful hybrid.

C. Luddemanniana (Luddemann's). *fl.*, sepals and petals delicate purplish-rose, suffused white, the petals nearly three times as broad as the sepals, and gently undulated, chiefly in the distal half; convolute lobes of the lip of the same colour externally as the sepals and petals, the anterior lobe fine amethyst-purple, crisped, emarginate, with two pale yellow or white blotches at the entrance of the tube, between which are lines of amethyst-purple gently diverging from the base of the lip. September and October. This is a variety of *C. labiata.* SYNS. *C. Dawsonii* (W. S. O. i. 16), *C. speciosissima Buchananiana* (W. O. A. vi. 261.)

C. L. alba (white). *fl.* large, pure white, with a pale yellow stain on the disk of the lip.

C. L. brilliantissima (most brilliant). *fl.*, sepals and petals bright rose, the latter with an amethyst-purple, feathered blotch near the apex; anterior lobe of the lip maroon-purple, with two pale yellow blotches beneath. SYN. *C. brilliantissima* (of gardens).

C. L. regina (queenly). *fl.*, sepals and petals rosy-purple; lip deep purple, with two yellow blotches as in the type.

C. luteola (yellowish). *fl.* yellow, 2in. across; sepals narrow-oval, blunt; lip white, with a yellow disk, cuculla e, rounded

Cattleya—*continued.*

and crenulate, velvety inside. Pseudo-bulbs oval, ancipitous, one-leaved. Brazil. (B. M. 5032; R. X. O. i. 83.) SYN. *C. Holfordi* (of gardens). The variety *fastuosa* has a large, purple blotch on the lip; in the form *lepida* the lip is veined purple.

C. Manglesii (Mangles'). *fl.* brighter and larger than those of *C. Loddigesii*; lip white, with a yellow line on the disk and two small, pale purple blotches, waved and toothed on the light purple margin. A hybrid between *C. Luddemanniana* and *C. Loddigesii.*

C. Mardelli (Mardell's). *fl.*, sepals and petals magenta; lip three-lobed, opening out on both sides of the column, the side lobes pale magenta, the front magenta-purple, with a broad, bright yellow stripe down the centre of the throat. June. Stems about 4½in. long, two-leaved. A hybrid between *C. Luddemanniana* and *Lælia elegans.* (F. M. ser. ii. 437.)

C. marginata. This is now regarded as synonymous with *Lælia pumila.*

C. Marstersoniæ (Marsterson's). *fl.* amethyst-coloured, intermediate in character between *C. Loddigesii* and *C. labiata*; lateral lobes of the lip yellowish-white, with an amethyst border, the middle lobe intense purple. Stems about 8in. long, two-leaved. Garden hybrid.

C. maxima alba (white). *fl.* white, having the usual yellow and purple markings on the lip.

C. m. aphlebia (veinless). In this variety the purple, reticulated veins are absent from the lip, which has a yellow disk surrounded by light purple. 1884.

C. m. Backhousei (Backhouse's). *fl.* richer in colour than those of the type. *l.* stiff, upright. Pseudo-bulbs short and plump. Colombia.

C. m. doctoris (teacher). A variety with pale rose-coloured flowers. 1883.

C. m. Hrubyana (Hruby's). *fl.* tinted pale rose; lip handsomely veined with red and marked with a central, yellow stripe. 1885. A beautiful variety.

C. Measuresii (Measures'). *fl.*, sepals and petals reddish-brown, ligulate, acute, the petals slightly undulated; lip whitish-rose, the side laciniæ forming a blunt angle, bearing a small point in the middle, involved at the upper part, the isthmus almost wanting, the anterior part cordate; column purple at top, rose at base. Pseudo-bulbs usually two-leaved. 1886. A hybrid between *C. Aclandiæ* and *C. Walkeriana.*

C. Mendelii. This is now regarded as a variety of *C. labiata.*

C. M. bella (beautiful). A charming variety, having whitish-mauve-lilac petals, and a darker mauve-lilac front part to the lip. 1882. (W. O. A. 225.)

C. M. grandiflora (large-flowered). *fl.* 8in. across; sepals and petals white, very broad; lip magenta-rose, white and frilled at the edge, fringed, broad, the throat lemon-yellow, lined pale magenta-rose. May and June. Colombia. (W. O. A. i. 3.)

C. M. Jamesiana (James'). *fl.* about 5in. across; sepals and petals rosy, tipped purple, broad; lip rich, velvety purplish-rose in the front half, the disk golden-yellow, the throat whitish, pencilled crimson. 1882. (W. O. A. iv. 178.)

C. M. Morganiæ (Mrs. Morgan's). *fl.*, sepals and petals snow-white, freely produced; lip white, beautifully fringed, with a distinct, bright magenta blotch towards the apex, the throat orange, with darker stripes. May and June. Colombia. Habit as in *C. Mendelii.* SYN. *C. Morganiæ* (W. O. A. i. 6).

C. M. superbissima (most superb). *fl.* very large; sepals and petals pale blush, broad; lip bright amethyst, much crisped and frilled at the edge, the throat rich yellow. Colombia.

C. Mitchelli (Mitchell's). *fl.*, sepals and petals purplish-violet; front lobe of the lip deep purple-magenta, the lateral lobes light purple, tipped magenta-purple, the disk orange, edged white. *l.* dark green. Stems about 1ft. long, two-leaved. A hybrid between *C. guttata Leopoldii* and *C. Trianæ quadricolor.* (F. M. ser. ii. 337.)

C. Morganiæ (Mrs. Morgan's). A form of *C. Mendelii.*

C. Mossiæ. This is now regarded as a variety of *C. labiata.*

C. M. Alexandræ (Alexandra's). *fl.*, sepals and petals pale blush; lip white, spotted and veined bright magenta; throat orange, marked crimson-purple.

C. M. Arnoldiana (Arnold's). *fl.*, sepals and petals whitish-rose; lip rather narrow. 1884.

C. M. aureo-marginata (golden-margined). *fl.* large; sepals and petals deep blush; lip deep violet-rose in the centre, yellow at base, the yellow stain continued so as to form a broad margin to the upper, expanded portion of the lip.

C. M. Blakei (Blake's). *fl.*, sepals and petals blush, the latter frilled towards the points; lip orange-buff at base, mottled violet-rose in front, the markings passing nearly to the edge.

C. M. candida (white). *fl.* sometimes 7in. across, but sparingly produced, and often deformed; sepals and petals white; lip crimson, fringed. June and July. *l.* light green. *h.* 1ft. Brazil. (F. d. S. 661, under name of *C. labiata candida.*)

Cattleya—*continued.*

C. M. complanata (flattened). *fl.* large, remarkable for the almost total absence of frilling; sepals and petals deep blush; lip broad and spread out at apex, stained orange at base, faintly mottled and veined purple over the centre, leaving a broad, pale blush edge.

C. M. conspicua (conspicuous). *fl.* large; sepals and petals blush; lip marked violet-rose, dashed orange at base, and having an irregular, pale border.

C. M. Hardyana (Hardy's). *fl.*, sepals and petals pale purple, irregularly blotched with magenta-purple; lip yellow and white, irregularly marked with darker magenta-purple than that of the sepals and petals. 1884. A remarkably beautiful and distinct form. (W. O. A. iii. 125.)

C. M. Nalderiana (Nalder's). *fl.* rosy-purple, with a slight, greyish hue, and darker borders and markings. Venezuela.

C. M. Reineckiana (Reinecke's). *fl.*, sepals and petals pure white; lip having an orange disk, and rays of violet lines and dots towards the margin. 1884.

C. M. Roëzlii (Roëzl's). *fl.* having two bright yellow eyes behind the purple apex of the lip. 1883.

C. M. Wageneri (Wagener's). The correct name of the plant described on p. 284, Vol. I., as *C. Wageneri.*

C. nobilior. This is now regarded as a variety of *C. Walkeriana.*

C. n. Huguenayi (Huguenay's). *fl.* purple, striated with red, and having a yellow blotch veined with red on the disk of the lip, large. Matto-Grosso, Brazil, 1885.

C. n. maxima (greatest). *fl.* richly coloured, large; sepals and petals of a beautiful lilac-purple; yellow spot on the lip veined with purple. 1885.

C. Percivaliana (Percival's). *fl.* smaller than in *C. Mossiæ*, but darker and richer in colour in the best forms; sepals and petals deep blush; lip intense magenta-crimson, margined with blush-pink, much fringed, the throat marked with golden and crimson lines. January and February. Colombia. A distinct form of *C. labiata.* (G. C. n. s., xxi., p. 178; W. O. A. iii. 144.)

C. P. alba (white). *fl.*, sepals and petals pure white; lip white, with an orange stain in the throat. Brazil, 1884.

C. P. bella (handsome). *fl.* bright purple; sepals, petals, and anterior part of lip spotted dark purple, the petals hard, wavy.

C. P. Reichenbachi (Reichenbach's). *fl.*, sepals and petals rich mauve-purple; front lobe of the lip deep purple, the purple running out into a point behind, on each side of which the lip is deep yellow with red venation. 1886.

C. porphyroglossa (purple-tongued). *fl.*, sepals and petals of a light chestnut-brown; lip very fine, the stalk of the anterior lacinia crenulated or serrated at the edges, the central lacinia much keeled; column white at back, yellow covered with purple stripes in front. 1887. This species resembles *C. guttata*, but has larger flowers.

C. p. punctulata (slightly dotted). *fl.* having scattered, crimson spots on the inside of the petals and a few on the sepals; column yellow, richly adorned with crimson. 1887.

C. p. sulphurea (sulphur-coloured). *fl.*, sepals and petals sulphur-coloured. 1887.

C. porphyrophlebia (purple-veined). *fl.* 4in. in expanse; sepals and petals pale mauve, the former narrow-oblong, the petals falcate-elliptic, 1in. broad; base of the lip pale mauve, the front lobe darker, with deep mauve veins, which are continued up the middle of the disk to the base, the front part of the side lobes pale yellowish, with light mauve at the wavy edge. 1885. A fine hybrid between *C. intermedia* and *C. superba.*

C. pumila. This is now regarded as synonymous with *Lælia pumila.*

C. quadricolor. A variety of *C. Trianæ.*

C. Regnelli. This is now regarded as synonymous with *C. Schilleriana.*

C. Reineckiana (Reinecke's). A variety of *C. Mossiæ.*

C. resplendens (resplendent). *fl.*, sepals and petals dull olive-brown, with thinly scattered purple spots; lip white, with amethyst keels and warts, the side laciniæ much developed and very acuminate. 1886. Probably a natural hybrid between *C. guttata* and *C. Schilleriana.*

C. Rollissonii (Rollisson's). A synonym of *C. Trianæ delicata.*

C. Sanderiana (Sander's). A synonym of *C. Warscewiczii.*

C. Schilleriana Amaliana. *fl.* having a very large and broad front lobe to the lip, which is densely veined bright purple on a white ground, the disk yellow. Brazil, 1887. Veitch unites *C. Regnelli* with the type.

C. Schofieldiana (Schofield's). A variety of *C. granulosa.*

C. Schrœderiana (Baron von Schrœder's). A variety of *C. Walkeriana.*

C. scita (clever). *fl.*, sepals, as well as the broad, waxy petals, pale ochre, with light purple blotches and shades; lip purple, with pale sulphur side lobes, having purple edges, and a white

Cattleya—*continued.*

disk with purple lines. 1885. A fine plant, allied to *C. guttata*, between which and *C. intermedia* it is supposed to be a cross.

C. Skinneri parviflora (small-flowered). *fl.* half the size of those of the type; lip whole-coloured, not pallid over the lower half. (B. M. 4916.) The following are sub-varieties: *alba*, snow-white, with a small primrose blotch on the lip, and, occasionally, some mauve-purple markings at the base. (W. O. A. iii. 112); *oculata*, with a large, maroon-purple blotch on the lip.

C. Sororia (sisterly). *fl.* resembling "a good, extra strong flower of *C. Harrisoniæ*" (Reichenbach); sepals tipped with greenish-yellow; petals having small, dark spots, more numerous inside than outside; lip white, with "the lightest purple" at the margin, and a few dark purple lines at the base. 1887. Supposed by Reichenbach to be a hybrid between *C. Walkeriana* and *C. guttata*.

C. speciosissima Buchananiana (Buchanan's). A synonym of *C. Luddemanniana*.

C. s. reginæ (queenly). A synonym of *C. labiata regina*.

C. suavior (sweeter). *fl.*, sepals and petals pale rosy-lilac, suffused white; side lobes of the lip white, tinted pale lilac towards the margins; middle lobe amethyst-purple, with a crisped margin and a deep sinus or cleft in the anterior margin; disk creamy-white, a purple band extending below it to the base. A hybrid between *C. intermedia* and *C. Mendelii*.

C. superba splendens (splendid). *fl.* three to seven in a spike; sepals and petals deep rosy-purple; lip rich rosy-violet in front, flushed with maroon. Rio Negro, 1883. A beautiful variety. (I. H. 605.)

C. Trianæ. This is now regarded as a variety of *C. labiata*.

C. T. alba (white). *fl.* white, with the usual yellow disk of the lip, in front of which is a small blotch varying in colour from rosy-purple to pale lilac.

C. T. Annæ (Anna's). *fl.*, sepals and petals bright rosy-purple; lip dark purple, the inside of the tube whitish, with a two-lobed, yellow blotch in front. 1886.

C. T. Backhousiana (Backhouse's). *fl.* very large; sepals and petals blush-pink; lip large, with a bright magenta stain on the anterior part, the throat marked pale yellow.

C. T. chocoënsis (Choco). The correct name of the plant described on p. 281, Vol. I., as *C. chocoënsis*.

C. T. Corningii (Corning's). *fl.* large, several on a spike; sepals and petals white, slightly tinged pale rose; lip white, with a slight blotch of orange on the anterior part.

C. T. delicata (delicate). *fl.* 6in. across; sepals and petals white; lip large, with a beautiful yellow centre and a tinge of rose, white outside. December and January. *h.* 1ft. Brazil, 1861. SYNS. *C. Rollissonii* (F. M. 1861, 8), *C. Warscewiczii delicata* (W. S. O. i. 4). *superba* is a fine variety, with a very large lip.

C. T. formosa (beautiful). *fl.*, sepals and petals mauve; lip of a rich magenta, the disk yellow, with radiating streaks of darker yellow. Columbia, 1884. (W. O. A. iii. 108.)

C. T. Hardyana (Hardy's). *fl.*, petals white, washed whitish-purple; anterior part of the lip warm purple, having a light border of purple round the wavy margin, and a light ochre central line with two anterior streaks.

C. T. Hooleana (Hoole's). *fl.*, lip rich magenta-purple, entire, marked with two curved, clavate, orange-yellow spots in the throat. New Grenada. (W. O. A. vi. 265.)

C. T. Leeana (Lee's). *fl.* about 7in. in diameter; sepals and petals rosy-lilac, 3in. across; lip deep magenta-mauve; faintly margined lilac-rose, 2in. in diameter in the fore part; throat striped orange, very large and open.

C. T. marginata (margined). *fl.* about 6in. in diameter, deliciously scented; sepals and petals blush-white; anterior portion of the lip bright magenta-purple, broadly margined white, beautifully fringed; throat orange.

C. T. Massangeana (Massange's). *fl.* white, streaked with purple-mauve; petals purple-mauve down the middle, with white spots and oblique, purple-mauve lines extending towards the border; lip having a white middle line bordered with purple, which radiates in lines outwards, the tip dark purple with a white border. 1883. (W. O. A. vi. 242.)

C. T. Osmanni (Osman's). *fl.* 7in. across; sepals and petals rosy-magenta, the former 1in., the latter 2½in., broad; lip intense magenta-crimson, 2½in. across, narrowly margined rosy-magenta; throat slightly marked yellow. A splendid variety. (F. M. ser. ii. 51.)

C. T. quadricolor (four-coloured). *fl.*, sepals and petals rosy-magenta, broad; anterior part of the lip magenta-crimson, the throat orange, the upper portion rosy-magenta, but darker than the sepals and petals.

C. T. reginæ (queenly). *fl.* 6in. in diameter; sepals and petals pure white, slightly flushed towards the centre, the former 2in., the latter 2¼in., broad; lip bright magenta-purple, broadly margined white, the throat pale yellow.

Cattleya—*continued.*

C. T. rosea (rosy). *fl.*, sepals and petals rose-coloured; lip bright rosy-lilac, with a yellow blotch at the mouth of the throat.

C. T. Schrœderæ (Baroness von Schrœder's). *fl.* generally very light purple, exquisitely perfumed, easily distinguishable from the type by the extraordinary crispation of both petals and lip, and by the well-known orange area of the lip reaching far more towards the apex. 1887.

C. T. Schrœderiana (Baron von Schrœder's). A fine form, with unusually long petals, and having a green blotch at the base of the column. 1886.

C. T. splendidissima (most splendid). A fine form, having white sepals and petals, and a dark purple-magenta lip. 1884. (W. O. A. iv. 150.)

C. T. Vanneriana (Vanner's). *fl.*, lateral sepals having a broad, orange, central stripe; lip with a fine purple apex, orange disk, and light rose side lobes. 1886.

C. T. Williamsii (Williams'). *fl.*, sepals and petals blush-white, broad, the petals veined rosy-magenta; lip intense crimson-purple, nicely fringed, with a slight blotch of yellow in the throat. *l.* often tinted bronze.

C. triophthalma (three-eyed). A synonym of *Lælia triophthalma*.

C. Veitchiana (Veitch's). *fl.*, sepals rich, bright pink; petals paler pink; lip deep, rich crimson-purple, yellow in the centre. Spring. A hybrid between *C. crispa* and *C. labiata*.

C. velutina (velvety). *fl.* very fragrant; sepals and petals pale orange, spotted and streaked purple; lip orange at base, white with violet veins in front, where the surface is velvety. Brazil. The habit of this supposed hybrid closely resembles that of *C. bicolor*. (G. C. 1872, p. 1259; W. O. A. i. 26.)

C. veriflora (true-flowered). *fl.*, sepals and petals rosy-violet; lip deep magenta, margined rose, the throat orange. Winter. *l.* light green, about 8in. long. Stems thick, 6in. long. A hybrid, of which *C. labiata* and *C. Trianæ* are probably the parents.

C. virginalis (virgin-white). A form of *C. Eldorado*.

C. Wageneri (Wagener's). This is now regarded as a variety of *C. Mossiæ*.

C. Walkeriana. SYN. *C. bulbosa*. In addition to *Schrœderiana*, *C. dolosa* and *C. nobilior* are now regarded as forms of this species.

C. W. Schrœderiana (Baron von Schrœder's). *fl.* purple, tinged mauve; lip with very small basal auricles and a transverse, oblong, apiculate blade; peduncle two-flowered. Pseudo-bulbs 4in. high, bearing two very stout, oblong leaves. 1883. A beautiful plant. SYN. *C. Schrœderiana*.

C. Wallisii (Wallis'). A form of *C. Eldorado*.

C. Warneri. This is now regarded as a variety of *C. labiata*.

C. Warscewiczii. This is now regarded as a variety of *C. labiata*. SYN. *C. Sanderiana*.

C. W. delicata (delicate). A synonym of *C. Trianæ delicata*.

C. Whitei (White's). *fl.* sweet-scented; sepals deep rose, flushed olive-green; petals deeper and brighter rosy-magenta, much broader and undulated; side lobes of the lip angular, blush towards the base, the reflexed borders and apex purplish-rose, the throat orange, the tube lined purple, the anterior lobe magenta-rose, veined deep crimson-magenta, roundish-reniform, undulated and denticulate. Brazil. Probably a natural hybrid between *C. labiata* and *C. Schilleriana*. (R. G. 1159; W. O. A. iii. 115.)

C. Zenobia (Zenobia). *fl.* 4in. across, intermediate between those of the parents; sepals and petals rosy-pink; lateral lobes of lip rosy-pink outside, paler inside, shading to very light yellow in front, the front lobe heavily veined with crimson-purple on a paler ground, and with a narrow, pale margin, the disk light yellow, with ridges inclining to buff. 1887. A hybrid between *C. Loddigesii* and *Lælia elegans Turneri*.

CAUTLEYA (named in honour of Major-General Sir P. Cautley, F.G.S., 1802-1871, joint author, with Dr. Falconer, of the "Fauna antiqua sivalensis"). ORD. *Scitamineæ*. A monotypic genus, included by some authorities under *Roscoea*. The species is a stove, perennial herb, requiring similar treatment to **Alpinia** (which *see*, on p. 54, Vol. I.).

C. lutea (yellow). *fl.* 1½in. to 2in. long; calyx red-purple, tubular, two-cleft at mouth; sepals linear-oblong, obtuse, concave, the dorsal one erect, the lateral ones reflexed; corolla golden-yellow, the tube exserted; lateral staminode like the dorsal sepal, erect, the tips incurved; spike 4in. to 8in. high. August. *l.* 5in. to 10in. long, narrow-lanceolate, with a slender tip, bright green above, paler or suffused or streaked red-brown beneath. Stems 8in. to 18in. high, tufted, erect, leafy. Himalaya, 1887. (B. M. 6991.)

CECROPIA. Nearly forty species have been referred to this genus, but, according to the authors of the "Genera Plantarum," this number might be reduced; they inhabit

Cecropia—*continued.*

tropical America, from Brazil to Mexico. To the species described on p. 285, Vol. I., one more calls for addition:

C. dealbata (whitened). *l.* large, soft, pubescent, palmate, light green above, glaucous beneath. New Grenada, 1887. A fine Snake-wood, of ornamental character.

CELASTRUS. Including *Orixa*. This genus embraces about eighteen species. To those described on p. 287, Vol. I., the following should now be added:

C. Orixa (Orixa). *fl.* green, small; males racemose; females long-stalked, generally solitary. Summer. *l.* elliptic or obovate, with entire margins; upper surface glossy-green. *h.* 6ft. to 9ft. Japan, 1886. SYN. *Orixa japonica* (R. G. 1232.)

CELMISIA (so called after Celmisius, who was said to be the son of the nymph Alciope, from whom the name of a nearly-related genus is derived). ORD. *Compositæ*. A genus embracing about twenty-five species of greenhouse or hardy, more or less silvery-silky, perennial herbs; one inhabits the Auckland and Campbell Islands, the rest are natives of New Zealand, one being also found in Australia. Flower-heads heterogamous, radiate; involucre broadly campanulate or hemispherical, the bracts many-seriate, imbricate; scapes (or scape-like peduncles) one-headed. Leaves entire. Two species have been introduced. For culture, *see* **Olearia,** p. 481, Vol. II.

C. coriacea (leathery). *fl.-heads* 1½in. to 3in. in diameter; ray florets white, excessively numerous; disk yellow; scapes very stout, cobwebby and cottony. *l.* 10in. to 18in. long, ¾in. to 2½in. broad, lanceolate, coriaceous, narrowed into broad, woolly sheaths, covered above with cottony hairs, below with dense, white-silvery tomentum. New Zealand. Hardy. SYN. *Aster coriacea.*

C. spectabilis (remarkable). *fl.-heads* 2in. in diameter; ray florets white or pale lilac, very numerous, revolute; disk yellow; scapes several, stout, stiff, erect, longer than the leaves. May. *l.* numerous, strict, erect, usually 5in. to 7in. long, ½in. to 1in. broad, thickly coriaceous, ensiform, elliptic-lanceolate, or linear-oblong, narrowed at base, then dilating into broad, tumid sheaths 2in. to 4in. long. Rootstock woody. Mountains of New Zealand, 1882. Hardy. (B. M. 6653.)

CENTROPETALUM (from *kentron*, a spur, and *petalon*, a petal; in allusion to the spur-like appendage at the base of the labellum). Including *Nasonia*. ORD. *Orchideæ*. A small genus (five or six species) of dwarf, creeping, cool-house Orchids, natives of the Columbian Andes. Flowers mediocre, solitary in the upper axils; sepals sub-equal, spreading, free, or the lateral ones more or less connate; petals similar or broader; lip connate towards the base with the column, at length erect, the lateral lobes scarcely prominent or broader and embracing the column, the lamina spreading, ovate or broadly rounded, undivided. Leaves distichous, short. *C. punctatum* (described on p. 421, Vol. II., as *Nasonia punctata*) is the best-known species.

CERASUS. Bentham and Hooker include this genus under *Prunus*. To the species described on pp. 295-7, Vol. I., the following should now be added:

C. acida (acid). Montmorency Cherry. *fl.* white; umbels aggregate, sparse, sessile. April and May. *fr.* red or dark purple; juice colourless. *l.* flat, glabrous, shining, sub-coriaceous, elliptic, all acuminate; petioles glandless. Orient, &c.

C. a. pyramidalis (pyramidal). A garden variety, with erect branches, forming a pyramidal growth like that of the Lombardy Poplar.

CERATOSTIGMA (from *keras*, *keratos*, a horn, and *stigma*, a stigma; alluding to the stigmas being beset with short, horn-like excrescences). SYN. *Valoradia.* ORD. *Plumbagineæ*. A small genus (three or four species) of greenhouse or hardy, perennial herbs or shrubs; one is Chinese, another Himalayan, and one or two are Abyssinian. Flowers densely capitate-spicate at the tips of the branches; calyx tubular, glandless, deeply five-cleft, the lobes narrow; corolla salver-shaped, the tube long and slender, the limb of five obtuse or retuse, spreading lobes. Leaves alternate, obovate or lanceolate, more or less setose-ciliated. Only one species calls for

Ceratostigma—*continued.*

mention here. It thrives in ordinary garden soil, and may be increased by divisions.

C. plumbaginoides (Plumbago-like). This is the correct name of the plant described on p. 169, Vol. III., as *Plumbago Larpentæ* (F. d. S. 307). SYN. *Valoradia plumbaginoides* (B. M. 4487).

CERATOTHECA (from *keras*, *keratos*, a horn, and *theke*, a case, a capsule; in allusion to the horned fruit). SYN. *Sporledera.* ORD. *Pedalineæ*. A small genus (two species) of erect, pubescent, stove or greenhouse, (? always) annual herbs, natives of tropical and South Africa. Flowers solitary in the axils, shortly pedicellate; calyx five-parted or deeply five-cleft; corolla tube enlarged above, the limb sub-bilabiate, with spreading lobes; stamens four, didynamous. Leaves opposite, or the upper ones alternate, ovate, toothed. *C. triloba*, the only species in cultivation, is probably a biennial. Seeds should be raised in heat, and the plants, when strong enough, removed to the greenhouse. Rich loam, a sunny position, and plenty of water when growing, are essentials to success.

C. triloba (three-lobed). *fl.* in opposite pairs, shortly pedicellate, with a minute, imperfect flower at the base of each; calyx erect; corolla pale violet-purple, with darker streaks, ⅔in. long, pilose. September. *l.* polymorphous, the lower ones long-petiolate, varying from broadly ovate-cordate to broadly triangular and three-lobed, crenate, the broadest leaves 8in. across; floral ones narrowly ovate, shorter than the flowers. Stem 5ft. high. Natal, 1886. (B. M. 6974.)

CEREUS. About 200 species of this genus are known, natives of tropical and sub-tropical America, the West Indies, and the Galapagos Islands. (*See also* **Pilocereus.**) To those described on pp. 299-300, Vol. I., the following should now be added:

FIG. 4. PORTION OF PLANT, WITH FLOWER, OF CEREUS BERLANDIERI.

C. Berlandieri (Berlandier's).* *fl.* 4in. across, produced on the young, upright stems; petals bright purple, strap-shaped, in an

Cereus—*continued.*

irregular ring; stamens rose-coloured, clustered. Summer Stems procumbent, not more than 6in. long and ¾in. thick, bearing, along the ridges, little tubercles, crowned with short spines. South Texas and Mexico. Plant dwarf, creeping, very soft and watery. See Fig. 4

FIG. 5. PORTION OF STEM, WITH FLOWER, OF CEREUS BLANKII.

C. Blankii (Blank's). This only differs from *C. Berlandieri* in having deep rose flowers, flushed with crimson, and longer, broader, and less spreading petals. Summer. Mexico (at high elevations). See Fig. 5.

FIG. 6. CEREUS CÆSPITOSUS.

C. cæspitosus (tufted). *fl.* deep rose-coloured; petals thirty to forty, oblong, acute, obtuse, or mucronate; tube having eighty to one hundred cushions clothed with long, ashy wool, and six to sixteen brown or blackish spines. Stems 4in. to 6in. high, 3in. to 4in. in diameter, simple or clustered, cylindric-ovoid, pale greyish or whitish, with scanty brown wool; ribs twelve to eighteen, ½in. to ¾in. broad at base; cushions close-set, with twenty to thirty straight spines ¼in. or more in length. New Mexico and Texas. See Fig. 6. (B. M. 6669.)

Cereus—*continued.*

FIG. 7. CEREUS CTENOIDES.

C. ctenoides (comb-like).* *fl.* 3in. to 4in. across, produced in the ridges near the top of the stem; petals bright yellow, resembling a Convolvulus; stamens yellow; pistil white. June or July. Stem 3in. to 5in. high, about 3in. in diameter, egg-shaped, producing offsets at the base; ribs fifteen or sixteen, spiral, with closely-set cushions of whitish spines ¼in. long. Texas. Rare in cultivation. See Fig. 7.

C. Engelmanni (Engelmann's). *fl.* purplish-carmine; sepals fifteen to twenty, ovate-lanceolate, prickly; petals acute; stigmas twelve, green, erect. *fr.* red, ovate. Stem ovate-cylindrical, eleven to thirteen-ribbed, bearing the flowers laterally at the apex; prickles radiating, whitish, about thirteen in a tuft. California, 1885. (R. G. 1174 [1175 a in text].)

C. enneacanthus (nine-spined). *fl.* freely developed on the ridges near the top of the stem; petals deep purple, spreading; tube spiny; pistil and stamens yellow. Stem seldom exceeding 6in. in height, less than 2in. in diameter, cylindrical, bright green,

Cereus—*continued.*

FIG. 8. PORTION OF STEM, WITH FLOWER, OF CEREUS ENNEACANTHUS.

tufted in old specimens; ribs shallow, broad, irregular on the top, with spine cushions on the projecting parts; spines frequently twelve (although the specific name implies only nine) to a tuft. Texas. A rare plant in cultivation. See Fig. 8.

C. Fendleri (Fendler's). *fl.* purple, sub-erect, 3in. in diameter; calyx tube and ovary bearing cushions covered with short spines;

FIG. 9. PORTION OF STEM, WITH FLOWER, OF CEREUS LEPTACANTHUS.

Cereus —*continued.*

inner sepals twelve to fifteen; petals sixteen to twenty-four. June. Stem ovoid or sub-cylindric, 5in. to 7in. high, 3in. to 4in. in diameter, pale green, simple or rarely branched at base; ribs nine to twelve, ½in. deep; radial spines seven to ten, the central one 1½in. long. New Mexico, 1880. (B. M. 6533.)

C. hypogæus (underground). *fl.* 2in long, the tube short, with a few spine tufts; petals purplish, margined with yellow, oblong, mucronate. Aerial stems cylindric or clavate, seven or eight-angled; tubercles with two to five or more bristle-like spines and three to five longer central ones. Underground stem minute, unarmed. 1883. (R. G. 1085.)

C. leptacanthus (slender-spined).* *fl.* several to a branch; petals deep purplish-lilac in the upper half, the lower part white, forming a shallow cup, notched on the edges; stamens white; anthers and stigma orange. May and June. Mexico, 1860. Habit as in *C. Berlandieri*. See Fig. 9.

FIG. 10. CEREUS MULTIPLEX.

C. multiplex (proliferous). *fl.* 6in. to 8in. long and across; sepals pointed; petals 2in. or more in length, 1in. wide, spreading out quite flat; tube clothed with small, hairy scales. Autumn. Stem globose, becoming pear-shaped with age, about 6in. high; ridges angled, clothed with clusters of about a dozen spines, the central one longest. South Brazil, 1840. See Fig. 10.

FIG. 11. CEREUS MULTIPLEX CRISTATUS.

C. m. cristatus (crested). Stems fasciated and divided into numerous crumpled, flattened branches. A remarkable monster See Fig. 11.

Cereus—*continued.*

C. paucispinus (few-spined). *fl.* axillary towards the top of the stem, 3in. broad; calyx sub-cylindric, with ten to fifteen clusters of short, pale spines; petals about thirty, dark red, tinged brown, elongate-spathulate, with concave tips. May. Stems 5in. to 9in. high by 2in. to 4in. in diameter; ridges irregular in shape, ½in. to ¾in. in diameter; tubercles variable; spines three to seven, stout, pale red-brown. New Mexico, 1833. (B. M. 6774.)

C. Philippii (Philippi's). *fl.* yellow, with reddish-tinted segments, about 1½in. long, campanulate; stamens in two distinct whorls, the outer arising from the base of the petals, the inner whorl united in a tube around the style. Stem cylindric, eight to ten-angled, the angles tubercled; tubercles with about eight short and four or five long spines. Chili, 1883. (R. G. 1079, f. 1.)

FIG. 12. STEM, BRANCHES, AND FLOWER OF CEREUS PROCUMBENS.

C. procumbens (trailing).* *fl.* 3in. long and broad, developed on the ends of the branches; petals bright rose-purple, spreading and recurved; anthers forming a corona-like ring, enclosing the rayed stigma. May and June. Stems spreading, prostrate, emitting upright branches 3in. to 4in. high, ½in. thick, generally only quadrangular or square, with small spines in tufts along the angles. Mexico. A pretty little Cactus. See Fig. 12.

CEROPEGIA. The fifty species of this genus inhabit tropical and South Africa, the East Indies, the Malayan Archipelago, and tropical Australia. To those described on pp. 300-1, Vol. I., the following should now be added:

C. Monteiroæ (Mrs. Monteiro's). *fl.* about three at the top of short, lateral peduncles; sepals small, acute; corolla green, 2in. to 3in. long, the mouth trumpet-shaped, the five clawed lobes white, spotted purple-brown. July. *l.* opposite, 2in. to 3in. long, oblong-ovate, sub-acute or obtuse, succulent, pale green, the edges purplish, undulated. Branches white, mottled brown. Delagoa Bay, 1884. Stove. (B. M. 6927.)

CHÆROPHYLLUM SATIVUM. A synonym of **Anthriscus cerefolium** (which *see*).

CHAMÆCERASUS ALBERTI. A garden name for **Lonicera Alberti** (which *see*).

CHAMÆCERASUS ALPIGENA NANA. A garden name for **Lonicera alpigena nana** (which *see*).

CHAMÆCLADON (from *chamai*, dwarf, and *kladon*, a branch; in allusion to the habit of the species). ORD. *Aroideæ* (*Araceæ*). A genus comprising about twelve species of stove herbs, inhabiting tropical Asia and the Malayan Archipelago. Flowers monœcious, all perfect; spathe small, sub-cylindrical, convolute below, gaping above, persistent; spadix inappendiculate, included, stipitate, sub-cylindrical, the male inflorescence much longer than the female. Leaves elliptic-ovate, varying to lanceolate, rarely cordate at base, the nerves nearly reaching the margins; petioles elongated, long-sheathing. Caudex short or almost wanting. Only one species is known in gardens. For culture, *see* **Schismatoglottis**, on p. 332, Vol. III.

C. metallicum (metallic-lustred). *fl.*, spathe fuscous-purple, 1in. long, mucronate; peduncle purplish, slender, 1in. to 1½in. long. *l.* 3½in. to 5in. long, 2½in. to 3½in. broad, elliptic, sub-acute, shortly mucronate, rounded or slightly cordate at base, metallic-green above, purplish beneath; veins five to eight on either side the midrib, curved, ascending; petioles 2½in. to 3in. long, nearly ¼in. thick, channelled, purplish. *h.* about 7in. Borneo, 1884. (I. H. 1884, 539.)

CHAMÆCYPARIS. America and Japan are the headquarters of this genus, which is included, by Bentham and Hooker, under *Thuya*. To the varieties of *C. Lawsoniana* described on pp. 303-4, Vol. I., the following should now be added:

C. Lawsoniana erecta alba (erect, white). A variety of slender, twiggy growth, stiff and compact, but feathery at the points, of a rich glaucous-whitish-grey or silvery hue. 1882.

C. L. Rosenthalii (Rosenthal's). A garden variety, differing from the type in its pyramidal growth, and in the branchlets not drooping. 1886.

CHAMÆDOREA. This genus comprises about sixty species, natives of Western tropical America. To those described on p. 305, Vol. I., the following should now be added:

C. polita (polished). *l.* bifid when young, breaking up with age into two pairs of pinnæ, with a large, terminal leaflet; petioles (and stems) smooth. Mexico, 1884.

C. pulchella (pretty). *l.* produced in profusion, gracefully arched, pinnate, having very numerous linear leaflets. 1885. A very ornamental Palm, suitable for table decoration.

C. Wobstiana (Wobst's). An ornamental Palm, bearing a close resemblance to *C. Sartorii*, but it is more robust, and has more numerous leaves. 1885.

CHAMÆPEUCE. To the species described on p. 306, Vol. I., the following should now be added:

C. Sprengeri (Sprenger's). *fl.-heads* white, fragrant; involucral scales smooth. *l.* linear-lanceolate, dark green with white veins, the side veins running into two or three marginal spines. 1883. Garden hybrid. A hardy perennial, useful for rockwork and carpet-bedding.

CHAMELUM (from *chamelos*, low, humble; in allusion to the habit of the plant). ORD. *Irideæ*. A small genus (two species) of half-hardy, perennial herbs, natives of Chili. Flowers two or more in a spathe, very shortly pedicellate; perianth yellow, the tube slenderly funnel-shaped, the lobes sub-equal, erecto-patent; stamens affixed to the throat, the filaments connate in a cylindrical tube; spathes terminal, solitary or numerously aggregate. Leaves few, linear, rather broad or sub-terete. *C. luteum* is known to cultivation. It thrives in well-drained, sandy loam, and may be propagated by division of the rootstock. In many parts of England it would probably prove hardy.

Chamelum—*continued.*

C. luteum (yellow). *fl.*, perianth 2in. long, highly glabrous, the limb segments lanceolate-linear; spathes two or three, erect, 1½in. long, glabrous, striated and pubescent at apex, sharply mucronate; scape terete, eight lines long, two-flowered. *l.* linear-filiform, erect, recurved, 2½in. long, scarcely half a line broad, shortly whitish-pubescent. 1884. (R. G. 1129, f. 6-9.)

CHEILANTHES. Upwards of sixty species, many of them extending beyond the tropics, are embraced in this genus. To those described on pp. 307-9, Vol. I., the following should now be added:

C. californica (Californian). A synonym of **Hypolepis californica** (which *see*, on p. 170, Vol. II.).

C. chlorophylla (green-fronded). *rhiz.* stout, paleaceous. *sti.* contiguous, 1ft. to 1½ft. long, erect, polished, naked, dark chestnut-brown. *fronds* 1ft. to 1½ft. long, 4in. to 8in. broad, ovate-lanceolate, tripinnatifid; pinnæ 3in. to 5in. long, ⅔in. to 1¼in. broad, distant, lanceolate; pinnules lanceolate, cut down to the rachis into numerous entire, linear-oblong segments. *sori* numerous, small, roundish, placed on both edges. South America, 1883. Greenhouse. SYN. *Hypolepis spectabilis* (H. S. F. ii. 88 B).

CHEVALIERA CROCOPHYLLA. *See* **Ananas crocophylla.**

CHIONODOXA. The four species of this genus are natives of the Orient. To those described on p. 315, Vol. I., the following should now be added:

C. sardensis (Sardis). *fl.* similarly coloured to those of *C. Luciliæ*, but not shading lighter in the centre; perianth stellate-infundibuliform, the limb twice exceeding the tube; pedicels cernuous; scape two to six-flowered. *l.* convolute-channelled. 1887. (Gn. xxviii., p. 178; R. G. 1255 B-C).

CHLOROPHORA (from *chloros*, greenish, and *phoreo*, to bear; alluding to the economic properties of *C. tinctoria*). ORD. *Urticaceæ*. A genus comprising only two species of milky, stove trees; one is a native of tropical America, and the other is tropical African. Flowers dicœcious, the males in cylindrical spikes, the females in globose or oblong heads; inflorescences of both sexes shortly pedunculate, solitary in the axils. Leaves alternate, petiolate, entire or toothed, penniveined; stipules lateral, caducous. The species thrives in almost any soil, and is readily propagated by cuttings of the half-ripened wood.

C. tinctoria (dyers'). Fustic-tree. *fl.*, male inflorescence 1½in. to 2⅜in. long; female ¼in. to ½in. in diameter; peduncles pubescent or puberulous. *l.* distichous, 2in. to 6in. long, 1⅜in. to 2⅜in. broad, ovate or ovate-elliptic, entire or toothed, rarely lobed; petioles ¼in. to ½in. long. *h.* 20ft. Tropical America, 1739. Yellow, brown, olive, and green dyes are extracted from the wood. SYN. *Maclura tinctoria.*

CHLOROPHYTUM. This genus comprises about forty species, natives of Asia, tropical and South Africa, and America. To the information given on p. 317, Vol. I., the following should now be added. For culture, *see* **Anthericum,** on p. 83, Vol. I.

C. elatum variegatum (tall, variegated). *fl.* white, with the keel of each segment slightly greenish, about 1in. in diameter, paniculate. Summer. *l.* bright green, with broad bands and blotches of yellowish-white, strap-shaped, reflexed in the upper half, narrowed gradually to an acute point. SYN. *Anthericum variegatum.*

CHONDRORHYNCHA. Colombia is the home of the few species included in this genus. Sepals sub-equal, narrow-oblong; petals much broader; lip articulated with the foot of the column, sessile, broad, erect, concave, undivided; pollen masses four. To the species described on p. 317, Vol. I., the following should now be added:

C. Lendyana (Lendy's). *fl.*, sepals and petals whitish-yellow, the lateral sepals reverse and retrorse, the petals very large; lip darker than the sepals and petals, large, elliptic, with a central, bidentate callus. 1886.

CHRYSANTHEMUM. Nearly 120 species have been referred to this genus, but not more than eighty are distinct as such; they are found in Europe, Asia (mostly temperate and North), America (mostly North), North and South Africa, and the Canary Islands. To the species and varieties described on pp. 318-24, Vol. I., the following should now be added (with the exception of *C. multicaule*, the species are hardy perennials):

C. cinerariæfolium (Cineraria-leaved). *fl.-heads* 1½in. in diameter; involucral bracts rounded and whitish at apex; ray florets white, tridentate; disk yellow. July and August. *l.* pinnatisect; segments narrow-elongated, few-lobed, pinnatifid or pinnatisect, spreading. Stem erect, slender, one-headed. Dalmatia. (B. M. 6781.)

C. Decaisneanum (Decaisne's). *fl.-heads* pale yellow, radiate, larger than those of *C. marginatum*. Autumn. *l.* obovate, pinnatifid. *h.* 1ft. to 1½ft. Japan, 1887. SYN. *Pyrethrum Decaisneanum.*

C. marginatum (margined). *fl.-heads* deep yellow, small, disposed in rounded corymbs. Autumn. *l.* cuneate-oblong, pinnatifid in the upper third, tomentose beneath and on the edge. Stems tomentose. Japan, 1887. SYN. *Pyrethrum marginatum.*

C. maximum (greatest). *fl.* white; involucral scales oblong, whitish-margined at apex; ray florets about 2in. long. *l.*, lower ones petiolate, cuneate at base, lanceolate, toothed from the middle to the apex; cauline ones sessile, broadly linear-lanceolate, serrated. Stem ascending, erect. *h.* sometimes 10ft. Pyrenees. (G. C. n. s., xxvi., p. 273.)

C. multicaule (many-stemmed). *fl.-heads* golden-yellow, solitary at the ends of the stems or branches, 1½in. to 2½in. in diameter; ray florets twelve to twenty, broadly oblong, obscurely crenate at the tip. July and August. *l.* succulent, very variable, linear-spathulate, trisected or pinnatifid. Stems many, terete, simple or branched, 6in. to 12in. high. Algeria, 1837. A glaucous, hardy annual. (B. M. 6930.)

Varieties. This useful autumn and winter flower never was so popular as it is at present. It is impossible to give the names of all the new varieties sent out, even last year and the year previous (1886-7), as the number of them is upwards of 250. A few of them are improvements on the old varieties, and are in the Japanese section principally. The single-flowered varieties are also very pretty, some of them being well worthy of cultivation, even in select collections.

Incurved. BENDIGO, yellow; BRONZE QUEEN, bronze (sport from QUEEN OF ENGLAND); JEANNE D'ARC, whitish, pink tipped; LORD ALCESTER, primrose (sport from EMPRESS OF INDIA); LORD EVERSLEY, white (sport from PRINCESS OF TECK); LORD WOLSELEY, bronze (sport from PRINCE ALFRED); MRS. NORMAN DAVIS, yellow; MRS. SHIPMAN, brown (sport from LADY HARDINGE); YELLOW GLOBE (sport from WHITE GLOBE).

Reflexed. AMY FURZE, lilac; CULLINGFORDII, crimson-scarlet; ELSIE, canary-yellow; GEORGE STEVENS, brownish-crimson; MDLLE. MADELEINE TEZIER, blush-white; PUTNEY GEORGE, crimson.

Anemone-flowered Japanese. This is quite a new section, and differs from the true Japanese in having a quilled centre. The florets are mostly twisted, and all of them are of the true Japanese form. BACCHUS, crimson; DUCHESS OF EDINBURGH, blush; FABIAN DE MEDIANA, lilac; MADAME CLOS, purplish-rose; MADAME THÉRÈSE CLOS, white, tinged rose; MDLLE. CABROL, rosy-blush; RATAPOIL, brown, gold-tipped; SŒUR DOROTHÉE SOUILLÉ, lilac-rose; SOUVENIR DE L'ARDENNE, pale purple.

Pompones. ANAIS, lilac, gold tip; BLACK DOUGLAS, maroon; BLUSHING BRIDE, blush; BOULE DE NEIGE, white; CHARDONNERET, yellow, with carmine tinge; EYNSFORD GEM, magenta-purple; FANNY, maroon-red; FIBERTA, yellow; FLAMBEAU TOULOUSAIN, rosy-violet; GOLDEN MDLLE. MARTHE, clear yellow; GOLDEN ST. THAIS, yellow; GOLDEN TREVENNA, yellow; LA PURETÉ, pure white; MDLLE. D'ARNAUD, rosy-purple, yellow-tipped; MDLLE. ELISE DORDAN, rose, very fine; MRS. MARDLIN, pale rose (sport from PRESIDENT); NELLY RAINFORD, buff (sport from ROSINANTE); OSIRIS, violet, yellow tip; POMPONIUM, yellow; SNOWDROP, pure white; SŒUR MELAINE, white hybrid; ST. MICHAEL, rich yellow.

Japanese. ALBUM PLENUM, white, cream centre; ALBUM STRIATUM, large, white, striped rose; AVALANCHE, large, pure white; BELLE PAULE, white edge, flushed rose; BERTHA FLIGHT, blush; BICOLOR, large, red and orange; BOULE D'OR, deep yellow, bronzy-flush; BUTTERCUP, yellow; CAREW UNDERWOOD, a bronzy sport from BARON DE PRAILLY; CERES, white, occasionally flushed purplish; CHARLES DICKENS, delicate purplish-rose; COQUETTE DE CASTILLE, pinkish-blush; DUCHESS OF ALBANY, orange-red; EDOUARD AUDIGUIER, maroon-purple; EDWIN MOLYNEUX, reddish-maroon, reverse of petals yellow; ELSIE, lilac; FERNAND FERAL, rose, shaded mauve; FLAMME DE PUNCH, red and yellow; GLORIOSUM, clear, rich yellow; GORGEOUS, golden-yellow; GRANDIFLORUM, large, rich yellow; JEANNE DELAUX, rich dark crimson; JUPITER, red-dish-crimson; LADY TREVOR LAWRENCE, pure white, large, broad petals; LA FRANCE, carmine, whitish centre; LAKMÉ, salmon and yellow; L'OR DU JAPON, bronzy-yellow, large florets; MACAULAY, lilac and yellow, curious laciniated petals; MADAME C. AUDIGUIER, rosy-lilac; MADAME JOHN LAING, creamy, with rose suffusion; MARGOT, rosy tint, cream centre; MDLLE. LACROIX (Syn. LA PURETÉ), creamy-white, very large; MONS. ASTORG, silvery-white and rosy-violet; MONS. BRUNET, lilac-mauve; MR. H. CANNELL, large, deep yellow; MR. H. WELLAM, creamy-white, purple suffusion; MR. JOHN LAING, reddish-brown, marked

Chrysanthemum—*continued.*

yellow; MRS. B. WYNNE, white, rose shade; MRS. DOUGLAS, creamy-white, recurved petals; MRS. GOLDRING, orange-yellow ground-colour; MRS. H. CANNELL, pure white, large, handsome flower; MRS. J. WRIGHT, pure white, handsome variety; PELICAN, white, broad florets; PHŒBUS, rich, clear yellow; PIETRO DIAZ, deep red and yellow reflex; RALPH BROCKLEBANK, yellow (sport from MEG MERRILEES); ROI DES JAPONAIS, reddish-maroon, broad florets, centre incurved; ROSEUM SUPERBUM, rose-lilac, brownish-yellow tips; SOUVENIR DU JAPON, lilac and purple, yellowish centre; VAL D'ANDORRE, reddish-brown, orange shade; WILLIAM ROBINSON, orange-salmon; WILLIAM STEVENS, orange-red.

Single-flowered. ADMIRAL SIR T. SYMONDS, large, yellow; CRUSHED STRAWBERRY, reddish-pink; HELIANTHUS, rich yellow; JANE, white; LADY CHURCHILL, yellowish-buff; MARIGOLD, brownish-crimson; MARY ANDERSON, pink, one of the best; MISS CANNELL, pure white, very beautiful; MISS ELLEN TERRY, magenta; MISS ROSE, blush; MRS. JOHN WILLS, white, tinged pink; OCEANA, blush; ORIFLAMME, brown; QUEEN OF THE YELLOWS; SCARLET GEM; SIMS REEVES, chestnut-red; W. A. HARRIS, bronze.

Early-flowering Varieties. ALICE BUTCHER, red; BLUSHING BRIDE, pink; GENTILESSE, sulphur, pink tint; GOLDEN MADAME DESGRANGE, yellow; HERMINE, dwarf, white; ILLUSTRATION, pink and white; LA PETITE MARIE, pure white; FLORA, yellow; LA VIERGE, large white; MRS. BURRELL, primrose; MRS. CULLINGFORD, white; PIERRE VERFIEL, orange and red; SALTER'S EARLY BLUSH, pale rose.

CHRYSOPHYLLUM. This genus comprises about sixty species, mostly tropical American, a few being found in Africa, tropical Asia, Australia, and the Sandwich Islands. To those described on p. 325, Vol. I., the following should now be added:

C. imperiale (imperial). *fl.* yellowish-green, fascicled at the sides of a branch as thick as the finger, pedicellate; corolla sub-rotate, five-lobed. April. *fr.* the size of a small apple, obtusely five-angled. *l.* 3ft. long, 10in. broad, petiolate, obovate-oblong or oblong-oblanceolate, acute or obtuse, deeply serrated. Brazil. (B. M. 6823.) SYN. *Theophrasta imperialis* (I. H. xxi. 184; R. G. 1864, 453.)

CHUSQUEA (said to be the native name of some of the species in the West Indies). SYNS. *Dendragrostis, Rettbergia.* ORD. *Gramineæ.* A genus embracing about thirty species of suffruticose or arborescent, sometimes climbing, American Grasses. Flowers in terminal panicles; spikelets one-flowered, variously paniculate. *C. abietifolia*, the only species known to cultivation in this country, is an interesting and graceful, stove, climbing Bamboo. It thrives in well-drained loam, and is propagated either by means of imported seeds or by division of the root-stock.

C. abietifolia (Abies-leaved). *fl.* in racemes, terminating the leafy branches; spikelets green and purple, ¼in. to ½in. long. December. *l.* ½in. to ⅔in. long, 1/12in. broad, strict, erect, sessile on the sheath, linear-lanceolate, acuminate. Stems wiry, smooth, terete. Jamaica, 1885. (B. M. 6811.)

CHYSIS. The six or eight species referred to this genus are natives of Mexico and Columbia. To those described on pp. 326-7, Vol. I., the following should now be added:

C. undulata (wavy). *fl.* ten to twelve in a raceme; sepals and petals of a lively orange-yellow; lip cream-coloured, marked with numerous lines of pink. Pseudo-bulbs 1½ft. high. Native country unknown. A rare but handsome species.

CINERARIA. The garden varieties are now more generally named. During the years 1886 and 1887 many distinct and handsome forms were exhibited. To those described on p. 330, Vol. I., the following should now be added:

Single-flowered. BLUE CIRCLE, dark disk, white centre, light indigo-blue margin; DR. MASTERS, deep rosy-red, white centre, fine form; E. J. DOWLING, dark blue, large flowers; MARCH PAST, dark disk, white centre, broad margin of maroon-crimson; MISS COOPER, dark disk, pure white centre, indigo-blue margin; MR. ALEXANDER, chocolate-purple; MRS. TUCKER, rosy-pink, tinted lilac; REV. J. H. WALTON, pure white centre, rich clear magenta margin; SPECIAL FAVOURITE, magenta; VICTORY, deep rich crimson self.

Double-flowered. ADVANCE, violet-blue; ASPASIA, deep blue; CRIMSON KING; FAUST, clear bright rose; GEM, bright lilac-pink; MAUVE QUEEN, mauve, with violet tinge; MISS CANNELL, white, tipped magenta; NELLIE, clear pink, white edge; PERFECTION, rosy-red.

CIRRHOPETALUM. The species of this genus are mostly natives of the East Indies or the Malayan Archipelago; one is found in the Mascarene Islands, another in China, and a third in Australia. To those described on pp. 330-1, Vol. I., the following should now be added:

Cirrhopetalum—*continued.*

C. Lendyanum (Lendy's). *fl.* whitish, with a greenish-yellow hue; lateral sepals free, twice as long as the ligulate, acuminate upper one; petals ligulate, acuminate; lip compressed, bicarinate on the narrow upper side; raceme umbellate. *l.* cuneate-oblong, acute, minutely bilobed, purple beneath. Pseudo-bulbs pyriform-tetragonal, reddish. 1887.

C. picturatum (picture). *fl.* 2in. or more in length; upper sepal ⅓in. long, with a terminal, purple thread ¼in. long; lateral sepals conniving into a pale, dirty green, convex blade; petals very small; umbel about ten-flowered; scape green, speckled with purple, 8in. to 10in. long; sheaths speckled red. *l.* solitary, 3in. to 6in. long, 1½in. broad, linear-oblong. Pseudo-bulbs tufted. Moulmein, 1885. (B. M. 6802.)

C. pulchrum (beautiful). *fl.*, dorsal sepal purple, dotted with fuscous-purple, the lateral ones connate in a yellow, purple-blotched, linear-oblong, obtuse lamina, 1½in. long; petals purple, falcate; lip purple, linear-oblong, recurved; pedicels ½in. long; umbel about seven-flowered; scape erect, 4in. to 5in. long. *l.* oblong, obtuse and emarginate at apex, narrowed at base, thick. Halmahera, 1886.

C. stragularium (curtained). *fl.*, middle sepal spotted purple, purple at top, elliptic, cucullate, the lateral ones sulphur, blotched and spotted purple; petals yellowish, spotted purple, brownish-purple at apex; lip numerously spotted with blackish-purple, curved, with two divaricate angles near the base, convolute. *l.* petiolate, cuneate-oblong, blunt, 6in. to 7in. long. 1887. This "may be the same as *C. pulchrum*" (H. G. Reichenbach).

CITRUS. This genus embraces, according to Bentham and Hooker, about five species, natives of tropical India, and broadly cultivated over the tropical regions of the globe. Calyx cup-shaped or urceolate, three to five-cleft; petals four to eight, linear-oblong, thick, imbricated; stamens twenty to sixty. Fruit globose or oblong, fleshy, many-celled. To the species described on p. 335, Vol. I., the following variety should now be added:

C. medica Riversii (Rivers'). Bijou Lemon. *fl.* white, small. *fr.* small, globose. *l.* elliptic, serrated, on short, wingless petioles. 1885. (B. M. 6807.)

CLAVIJA. About twenty-five species, all tropical American, are here included. To those described on p. 336, Vol. I., the following should now be added:

C. Ernstii (Ernst's). *fl.* pendulous, ⅔in. long; corolla fleshy, the disk apricot-colour; racemes 2in. to 4in. long, drooping, many-flowered. July. *l.* clustered at the ends of the branches, on long petioles, coriaceous, 12in. to 16in. long, 4in. to 6in. broad, pale beneath, elliptic-oblong, oblong-lanceolate, or oblanceolate, acute or sub-acute, entire. Trunk (in native specimens) 4ft. to 5ft. high. Caraccas, 1879. (B. M. 6928.)

CLEISOSTOMA. This genus comprises about fifteen species, natives of the East Indies, the Malayan Archipelago, and tropical Australia. To those described on p. 337, Vol. I., the following should now be added:

C. crassifolium (thick-leaved). *fl.* sea-green, with a rosy lip, small, produced in nodding panicles from the axils of the leaves. *l.* closely set, thick, leathery, much recurved, resembling those of a Vanda. India, 1850. (L. J. F. 397; P. F. G. iii. 29.)

CLEMATIS. About 100 species are included in this genus; they are mostly dispersed over temperate regions, and are rarely found within the tropics. To the species and varieties described on pp. 338-40, Vol. I., the following should now be added:

C. reticulata (reticulated). *fl.* dull greenish and purplish, solitary, pendulous, on long peduncles; sepals connivent, recurved at the tips. September. *l.* leathery, prominently reticulated; upper ones simple, elliptic; lower ones pinnate, with seven to nine variable leaflets. Southern United States, 1880. A rambling, hardy or nearly hardy climber. (B. M. 6574.)

C. rhodochlora (reddish-green). *fl.* about the size of those of *C. Viticella*; two smaller sepals vinous-red above, paler towards the base, whitish flushed with red beneath; larger sepals nearly double the size of the smaller ones, green, quite foliaceous. *l.* simple, broadly oval or sub-cordate, shortly stalked. 1887. Garden variety.

C. stans (erect). *fl.* opal-blue, sub-verticillately clustered, pendulous; whorls disposed in a contracted, terminal panicle; sepals linear, acuminate, recurved. September. *l.* trifoliolate; leaflets obliquely roundish-ovate, acute, deeply toothed or somewhat lobed, wrinkled, the upper ones narrower. Stem erect, herbaceous, softly pubescent. *h.* 2ft. to 3ft. Japan. Hardy. (B. M. 6810.)

Clematis —*continued.*

C. tubulosa Hookerii (Hooker's). *fl.* lilac, tubular, ¾in. long, pedicellate, disposed in axillary clusters. *l.* large, pinnately trifoliolate; leaflets elliptic, acute, dentate. North China, 1885. An ornamental, hardy shrub. (B. M. 6801.)

CLERODENDRON. This genus comprises about seventy species, most of them broadly dispersed over the warmer regions of the globe; a few are natives of America (mostly in the West Indies or Columbia), and one is broadly diffused over the maritime regions of tropical America. To those described on pp. 341-2, Vol. I., the following should now be added. They require stove treatment.

C. Balfourianum (Balfour's). A variety of *C. Thomsonæ.*

C. delectum (chosen). *fl.* showy, freely produced in large, dichotomous cymes; calyx pure white; corolla of a deep, rich magenta-rose. 1885. A handsome, garden variety, raised from *C. Thomsonæ Balfourianum.*

C. illustre (illustrious). *fl.*, calyx reddish-scarlet, sub-globose; corolla bright scarlet, the tube ¾in. long, the limb eight to nine lines in diameter; panicle branches and pedicels red. *l.* cordate, acute, 7in. to 8in. long, 6in. to 6½in. broad, repand-toothed, glabrous or nearly so above, scaly beneath. Celebes. A showy plant, producing its large panicles of flowers when only 1½ft. high.

C. macrosiphon (long-tubed). *fl.* forming a small, sub-sessile, terminal, reduced cyme; calyx ¼in. long; corolla white, the tube 4in. to 4½in. long, ⅛in. in diameter, hairy, erect, slightly curved; limb one-sided, 1½in. in diameter, five-lobed to the middle. May. *l.* 2in. to 3in. long, oblanceolate or elliptic-lanceolate, acuminate, coarsely and irregularly toothed or almost lobulate, the base gradually narrowed into a petiole. Zanzibar, 1881. A slender, erect shrub. (B. M. 6695.) SYN. *Cyclonema macrosiphon.*

C. Minahassæ (Minahassa). *fl.* yellowish-white, in broad, terminal, cymose panicles; anthers purple, exserted. *fr.* very ornamental, the calyx growing out so as to resemble a red flower 3in. across, with a round, blue berry in the centre. *l.* opposite, obovate, serrated. Stems square. Celebes, 1886. An ornamental shrub.

C. nutans (drooping). *fl.* white, scentless, slightly ascending, ternate; calyx reddish-purple; corolla lobes obovate, obtuse, almost equal, flat; stamens longer than the corolla; panicles oblong, loosely pendulous. December. *l.* ternate or opposite, long-acuminate, entire, attenuated at base, very shortly petiolate. *h.* 2ft. to 4ft. Sylhet, &c., 1830. Shrub. (B. M. 3049.)

C. Rumphianum (Rumph's). *fl.* at first flesh-coloured, deepening to red and crimson, long-tubed, in terminal panicles; stamens red, exserted. *l.* large, roundish-ovate, dark green. Java, 1887. A handsome shrub.

C. Thomsonæ Balfourianum (Balfour's). *fl.* light crimson; calyx rather larger than in the parent. 1885.

COCHLIODA (from *kochlion*, a little snail; in reference to the curiously shaped callus). ORD. *Orchideæ.* A genus embracing about six species of stove or greenhouse, evergreen, epiphytal Orchids, natives of the South American Andes. Flowers often red, loosely racemose, pedicellate; sepals equal, spreading, free, or the lateral ones more or less connate; petals nearly similar; claw of the lip erect, the lamina spreading, the lateral lobes rounded and often reflexed, the middle one narrow, entire or emarginate, not exceeding the sepals; column erect, often slightly incurved; scapes one or two, springing from under the pseudo-bulbs. Leaves oblong or narrow, coriaceous, contracted into the petioles. Pseudo-bulbs one or two-leaved. The three species here described should be grown in baskets suspended from the roof of the cool-house. Peat and moss form the most suitable compost; and abundance of water during the growing season is essential. Propagation may be effected by division of the pseudo-bulbs.

C. rosea (rosy). *fl.* wholly rosy-carmine, except the white tip of the column, about 1in. across; sepals and petals oblong-elliptic; lip cuneate at base, the small lateral lobes inclosing the disk, which bears a four-lobed callus, the middle one longer, linear, dilated at the end; racemes drooping, twelve to twenty-flowered. Winter. *l.* ligulate-oblong. Pseudo-bulbs green, tinted violet, ovate, two-edged. Peru, 1851. SYNS. *Mesospinidium roseum, Odontoglossum roseum* (B. M. 6084; I. H. ser. iii. 66).

C. sanguinea (bloody). *fl.* numerous, bright rose-coloured, waxy in appearance; racemes slender, drooping, slightly branched. Summer and autumn. *l.* two, cuneate-ligulate. Pseudo-bulbs oval, compressed, banded with mottled brown. Peru and Ecuador. SYN. *Mesospinidium sanguineum* (B. M. 5627).

C. vulcanica (volcanic). *fl.* about 2in. across; sepals and petals dark rose; lip bright rose in front, paler on the disk, where there

Cochlioda—*continued.*

is a four-keeled callus; the side lobes roundish, the middle one emarginate; racemes unilateral, erect, twelve to twenty-flowered; peduncle slender, erect. *l.* oblong, keeled, 3in. to 5in. long. Pseudo-bulbs ovoid, compressed, more or less two-edged. Eastern Peru. SYN. *Mesospinidium vulcanicum* (B. M. 6001).

CODIÆUM. According to the authors of the "Genera Plantarum," the number of distinct species is only four, and they are found in the South Pacific Islands, Australia, and the Malayan Archipelago. The garden varieties, however, are very numerous. To those described on pp. 350-5, Vol. I., the following should now be added:

C. aureo-marmoratum (gold-marbled). *l.* 1ft. long, 3in. broad, dark olive-green, marbled with yellow. 1884.

C. aureo-punctatum (gold-dotted). *l.* linear, obtuse, bright green, dotted and spotted with yellow. 1883. A small form.

C. Austinianum (Austin's). *l.* erect, 6in. to 9in. long, 2in. broad, blotched and margined with creamy-white and suffused with pink, the margins undulated. 1883. A compact form, of dwarf, branching habit.

C. Beauty. *l.* lanceolate, green, variegated golden-yellow, the ground colour eventually becoming a deep bronze, while the yellow variegations change into a rich rosy-crimson. South Pacific, 1887.

C. Bragæanum (José Terceiro Da Silva Braga's). *l.* pendulous, linear-lanceolate, 1½ft. to 1¾ft. long; many of the young ones pale yellow, marbled and mottled light green, others green, spotted golden-yellow; mature ones deep olive-green, spotted and speckled bright yellow, the midribs crimson. 1882.

C. Broomfieldii (Broomfield's). *l.* 9in. to 10in. long, 2in. to 2½in. wide, dark green, lined, spotted, blotched, and margined yellow, and having a central band of the same colour; midrib tinted red. 1887.

C. Bruce Findlay. *l.* large, oblong-obovate, freely variegated with yellow on the lines of the midrib and principal veins. 1882. A bold and handsome plant.

C. caudatum-tortile (twisted-tailed). *l.* pendulous, twisted, some of them deep olive green, with a yellow central band and a crimson midrib; others almost wholly yellow, becoming suffused with crimson; others variously blotched and spotted. 1883. A graceful form.

C. contortum (twisted). *l.* ovate, acuminate, recurved, 6in. to 8in. long, having the cross-veins and margins sulphur-yellow on an olive-green ground. 1884. This plant resembles *C. volutum.*

C. Crœsus. *l.* oblong-lanceolate, bright green, blotched with yellow. 1883.

C. cronstadtii (Kronstadt). *l.* of medium size, lanceolate, twisted, curled, and crisped, tapering to a sharp point, deep, glossy green, variegated with light golden-yellow. 1882. An interesting plant.

C. Dayspring. *l.* oblong-elliptic, orange-yellow, edged dark green, the yellow parts becoming tinged with red on the older leaves. 1882.

C. Delight. *l.* oblong, acute, 6in. to 8in. long, 1½in. to 2in. broad, when young bright yellow, margined green, the midrib and primary veins creamy, the central variegation changing with maturity to clear ivory-white, a few dots of the same colour being scattered along the margin. Antipodes, 1888.

C. eminens (eminent). *l.* broadly lanceolate, tapering, glossy green, the midrib and part of the lateral veins white. 1883. Habit dense.

C. excurrens (excurrent). *l.* oblong, stalked; midrib excurrent like a small horn near the apex of the leaf, which is variegated with greenish-yellow. 1884.

C. Exquisite. *l.* 6in. to 9in. long, 2in. broad, obovate, acuminate, arching, pale green, marbled and margined primrose and yellow.

C. Eyrei (Eyre's). *l.* long and narrow, twisted, recurved, freely variegated with yellow; petioles and young branches red. 1883.

C. formosum (handsome). *l.* green, spotted yellow, which afterwards changes to crimson; centre and principal veins yellow, becoming, with the margin, a bright magenta-purple; leafstalks crimson. Hybrid.

C. Golden Queen. *l.* 8in. to 10in. long, 3in. broad, ovate, acuminate, deep green, spotted with gold, the centre wholly golden; petioles rose-colour.

C. heroicum (heroic). *l.* green, freely marked deep yellow, the veins, and often the half, or even the whole, leaf surface, being yellow, occasionally flushed or lined rosy crimson. Hybrid.

C. Jubilee. *l.* 10in. to 14in. long, 2in. broad, lanceolate, acuminate, with a broad, central stripe, cross veins, and a narrow margin of golden-yellow, which colour changes with maturity to a fiery-crimson. 1887.

C. Junius. *l.* long, narrow, varying in outline, the lower half lemon-yellow, becoming suffused crimson with age, the remaining portion bronzy-green; petioles and stems bright orange-scarlet. 1888.

Codiæum—*continued.*

C. Katharina. *l.* 9in. to 12in. long, 2in. broad, spiral, closely set, splashed and marbled crimson and scarlet 1887.

C. lineare (linear). *l.* 4in. to 6in. long, linear, usually obtuse, but sometimes narrowed to the point, dark green, with a yellow midrib and a few lateral blotches of the same colour, occasionally almost wholly yellow.

C. Magnificent. *l.* ovate-lanceolate, 6in. to 8in. long, 2½in. broad, when young having a central variegation of golden-yellow; with maturity the margins become deep olive-green, while the mid-

Codiæum—*continued.*

rib and primary veins, with a narrow band on each side the midrib, assume a bright carmine. 1888.

C. Monarch. *l.* oblong, acute, 1ft. long, 2½in. broad, dark green, spotted bright yellow. Antipodes, 1888.

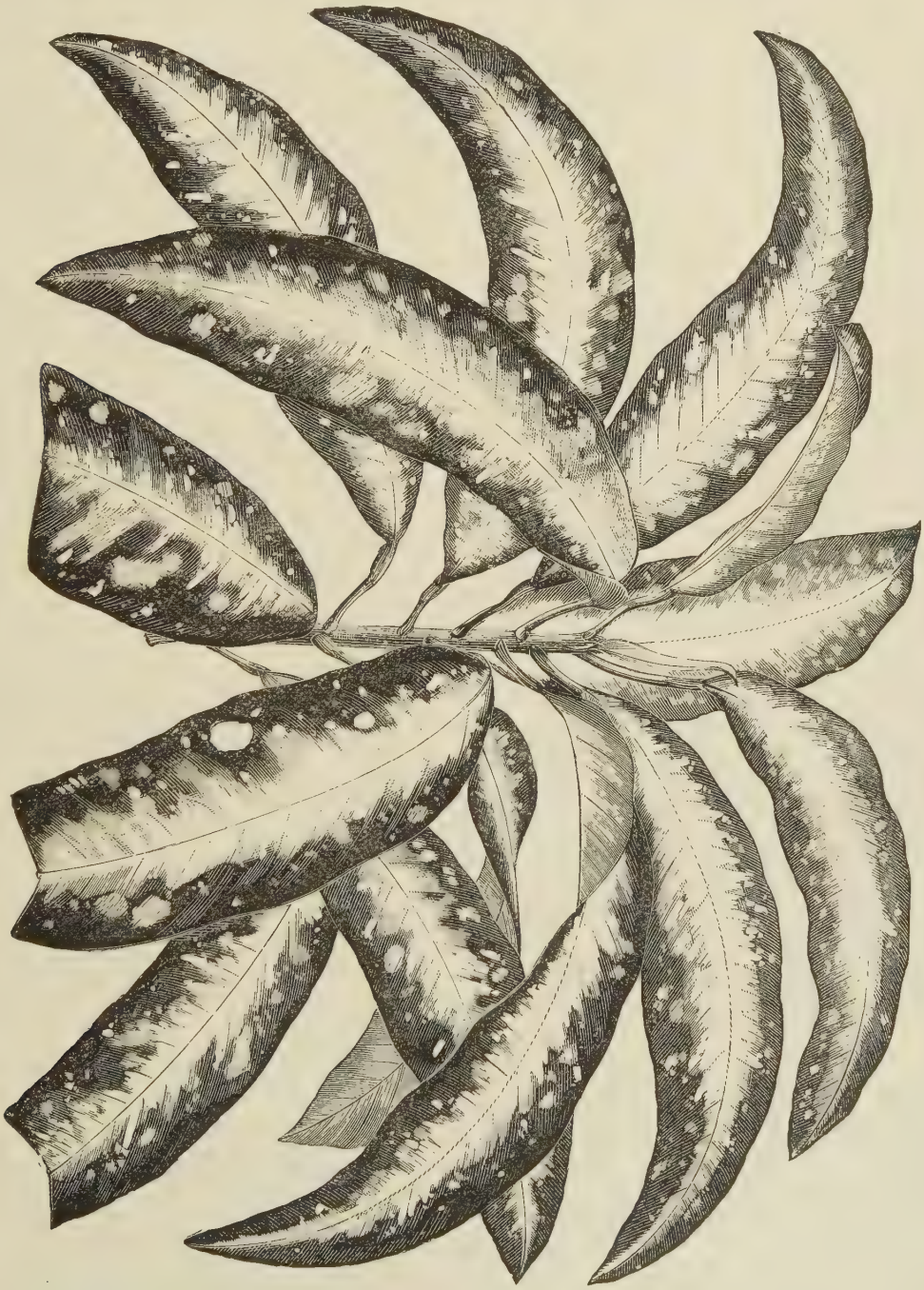

FIG. 13. UPPER PORTION OF BRANCH OF CODIÆUM NESTOR.

C. Mrs. Swan. *l.* 6in. to 9in. long, 1¼in. broad, lanceolate, acuminate, arching, the centre irregularly marked with golden-yellow, the margin of dark green spotted with golden-yellow; petioles and stem crimson.

C. musaicum (mosaic). *l.* oblong-lanceolate, acuminate, wavy,

Codiæum—*continued.*

crimson, with one or two series of irregular, green blotches on each side of the midrib; in the young leaves the crimson is replaced by a creamy colour, affording a very handsome variegation. 1883. SYN. *Croton musaicus* (R. H. 1882, 240).

C. Nestor. *l.* lanceolate, bright green, variegated with yellow and whitish, the variegation forming a broad, central stripe, the midrib bright magenta-crimson. Polynesia, 1887. A form of *C. medium variegatum.* See Fig. 13, for which we are indebted to Mr. Wm. Bull.

C. ornatum (adorned). *l.* green, blotched yellow, and with a narrow central band and long parallel veins of creamy-yellow, the yellow parts becoming crimson; occasionally, the lines and blotches are rosy-pink, and the midrib of a deeper rosy-crimson.

C. Phillipsii (Phillips'). *l.* linear-lanceolate, 8in. to 10in. long, ¾in. broad, the base rich golden-yellow, this colour extending half-way through, and continuing along the centre nearly the whole length. 1886.

C. Prince Henry. *l.* 1ft. to 1½ft. long, 3in. broad, recurved, the midrib crimson and gold, furrowed, with a narrow margin, occasionally spotted on a dark, bronzy-green ground; markings changing with maturity to a deep blood-red.

C. Princess of Waldeck. *l.* broadly lanceolate, about 4in. long, the central portion of a bright, clear yellow, with a broad and distinct margin of deep green. 1882. A handsome variety.

C. recurvatum (recurved). *l.* recurved, lanceolate, acuminate, marked with yellow along the crimson midrib and lateral veins. 1883.

C. ruberrimum (very red). This is one of the narrow, drooping-leaved forms, with the usual crimson and creamy variegation. 1884.

C. rubro-lineatum (red-lined). *l.* spreading, oblong-lanceolate, 1in. to 1½in. long, when first expanded pale yellow and green, many of them tinged rose, but deepening with age to golden-yellow and olive-green, the midrib and nerves, and, in many cases, the margin also, becoming crimson. 1882. A noble plant.

C. sceptre (sceptre). *l.* ribbon-like, dark bottle-green, spotted with fiery orange and yellow; midrib crimson. 1884.

C. Sunshine. *l.* 9in. to 10in. long, about 2in. wide, dark bronzy-green, when young blotched with yellow, which gradually changes into rosy-crimson, eventually becoming blood-red. South Sea Islands, 1887.

C. Torrigianianum (Marchesi Torrigiani's). *l.* plain, about 1in. broad, at first ribbed and veined with yellow, subsequently assuming a high crimson tint along the midrib, margins, and transverse arching veins, the intermediate spaces being green; petioles and stem red. 1884. A handsome plant, in the way of *Queen Victoria.*

C. Van Oosterzeei (Van Oosterzee's). *l.* narrow linear-lanceolate, acuminate, green, spotted with yellow. 1883. A small, but distinct and ornamental, shrub. (I. H. 1883, 502.)

C. Victory. *l.* 1ft. long, 2½in. broad, deep olive-green, with crimson veins and midrib, from which latter extends, in an arcuate manner, a coloration of reddish-crimson, the deep green between the primary veins being broken up in an irregular manner by the same bright colour; young ones orange-yellow, suffused crimson. 1888.

C. vittatum (striped). *l.* green, marked with a broad band of creamy-yellow, which runs out laterally along the bases of the distant primary veins; petiole (as well as the midrib in older leaves) bright ruby-red. 1887.

C. Wigmannii (Wigmann's). *l.* 8in. to 10in. long, ½in. broad, irregular in form, rich green, blotched with yellow. 1886. A good decorative plant for the table.

CŒLIA. Of this genus there are four or five species, natives of the West Indies, Central America, and Mexico. To those described on p. 356, Vol. I., the following should now be added:

C. bella (beautiful). *fl.* three or four, erect, 2in. long; perianth yellowish-white, with rose-purple tips to the segments, and having an orange mid-lobe to the lip, tubular below, funnel-shaped above; scape 2in. to 4in. long, clothed with brown sheaths. Autumn to December. *l.* several, 6in. to 10in. long, elongate-ensiform, acuminate. Pseudo-bulbs 1½in. to 2in. long, globose or ovoid. Ile St. Catherine, 1882. (B. M. 6628; W. O. A. ii. 51.) SYN. *Bifrenaria bella* (L. J. F. iii. 325).

CŒLOGYNE. This genus embraces about fifty species, broadly dispersed over the East Indies and the Malayan Archipelago, one extending as far as South China. To those described on pp. 356-8, Vol. I., the following should now be added:

C. birmanica (Birma). *fl.* having a shortly-toothed front border to the lip, and a nearly entire border round the anther; along the crests are several brown spots on a white ground. Birma, 1883. Probably only a trifling variety of *C. præcox.*

C. concolor (concolorous). *fl.*, sepals and petals dark rose; lip dark rose, with yellow blotches, in which are several brownish-

Cœlogyne—*continued.*

crimson spots, elegantly fringed, the crest pale yellow. *l.* (and pseudo-bulbs) as in *C. præcox.* India. SYN. *Pleione concolor.*

C. cristata alba (white). *fl.* wholly white. Winter and spring. India. (W. O. A. ii. 54.) SYN. *C. c. hololeuca.*

C. c. citrina (citron-colour). *fl.* having the centre of the lip stained delicate lemon-colour. Nepaul. SYN. *C. c. Lemoniana.*

C. c. hololeuca (wholly white). A synonym of *C. c. alba.*

C. c. Lemoniana (Lemon's). A synonym of *C. c. citrina.*

C. c. major (larger). *fl.* larger than in the type, with much broader and stouter sepals and petals. India.

C. c. maxima (greatest). A large-flowered variety, with unusually broad sepals and petals, and shallow side lobes to the lip. 1886.

C. Dayana (Day's). *fl.* light ochreous; sepals and petals ligulate, acute; lip broad, three-lobed, the side lobes striped dark brown, wavy, the middle lobe reniform, crenulate, with a dark brown crescent, two keels running from the base of the lip to the base of the middle lobe, where they divide into six; inflorescence long, lax, many-flowered. *l.* stalked, oblong, acuminate. Pseudo-bulbs long, narrow, fusiform. Borneo, 1884. (G. C. n. s., xxvi., p. 44; W. O. A. vi. 247.)

C. elata (tall).* *fl.* medium-sized; sepals and petals white, narrowish; lip white, with a forked, yellow band in the centre, and two orange-striped crests on the disk; racemes erect, springing with the leaves from the apex of the pseudo-bulbs. *l.* sword-shaped, striated. Pseudo-bulbs tall, oblong, angled. Tongoo, Darjeeling (8000ft. to 9000ft.), 1837. (B. M. 5001.)

C. Foërstermanni (Foërstermann's). *fl.* white, with some yellowish-brown on the disk of the lip; sepals and petals ligulate, acute; lip trifid, the lateral laciniæ rounded, the middle one rounded and apiculate; peduncles sometimes forty-flowered. *l.* cartilaginous, ribbed, 1½ft. long, 3in. or more wide, on very short petioles. 1887.

C. glandulosa (glandular). *fl.* pure white, 1½in. in diameter, disposed in a nodding raceme; front lobe of the lip ovate, marked on the disk with yellow lines. *l.* oblong-lanceolate. Pseudo-bulbs ovate, sulcate. Neilgherries, 1882.

C. graminifolia (Grass-leaved).* *fl.* nearly 2in. across the petals; sepals white, narrowly oblong-lanceolate, acute; petals similar, but rather narrower; lip three-lobed, the lateral lobes white, streaked purple, oblong, the middle one orange-yellow, with three purple ridges; raceme two to four-flowered; scape 1in. to 2in. long. January. *l.* two, Grass-like, 1ft. to 1½ft. long. Pseudo-bulbs 1in. to 1½in. long. Moulmein, 1886. (B. M. 7006.)

C. Hookeriana brachyglossa (short-lipped). *fl.*, lip white, with light sulphur on the disk, and with several reddish-brown spots, open, not at all abruptly convolute, yet the upright sides of the lip show lobes. 1887.

C. humilis albata (white-clothed). In this variety the sepals and petals are snowy-white, and the lip white, with light mauve-purple, radiating lines of small, confluent spots, and with an orange spot on each side of the anterior part.

C. lactea (milky). *fl.*, sepals and petals creamy-white, faintly tinged yellow; side laciniæ of lip light ochre, veined brown, mid-laciniæ bright yellow at base. *l.* 7in. to 8in. long, very thick, cuneate-oblong, acute, petiolate. Pseudo-bulbs light green, plump, short, wrinkled. Birma, 1883.

C. Lowii (Low's). A synonym of *C. asperata.*

C. maculata virginea (maiden). *fl.*, lip tinted with light sulphur, the nearly evanescent, purple lines in the middle very few. 1887.

C. ochracea (ochreous). *fl.* white, very fragrant, produced in erect racemes of about seven or eight; lip having two horseshoe-shaped blotches on the disk, which are bright ochreous-yellow, bordered orange. *l.* two or three, lanceolate. Pseudo-bulbs small, oblong. North-east India, 1844. (B. M. 4661; B. R. 1846, 69; L. J. F. 342.)

C. præcox (early). The correct name of the plant described on p. 358, Vol. I., as *C. Wallichiana.*

C. p. tenera (slender). *fl.* pale lilac and yellow, having a few purple-mauve blotches on the lip. 1883.

C. Rossiana (Ross'). *fl.*, sepals and petals creamy-white, ligulate, acute; lip mostly ochre, the disk, broad claw, and top of the mid-lacinia white; column white, with a brown mid-line in front; bracts linear, acuminate. *l.* two, long-petiolate, cuneate-oblong-lanceolate, acute, more than 1ft. long and 1½in. broad. Pseudo-bulbs nearly obpyriform. Birma, 1884.

C. salmonicolor (salmon-coloured). *fl.* salmon-coloured, solitary, the three-lobed lip being somewhat tessellated with brown. *l.* solitary; cuneate-oblong, acuminate, undulated, green at base, coppery elsewhere. Pseudo-bulbs tetragonal, pear-shaped. Java or Sumatra, 1883. Allied to *C. speciosa*, but smaller.

C. Sanderiana (Sander's).* *fl.* snow-white, large and showy; sepals ligulate, acute; petals lanceolate, acute, dilated above; side laciniæ of the lip marked with three brown stripes, the anterior lacinia yellow, with a few white marks, and having yellow crests; peduncles sometimes nine-flowered. *l.* petiolate, cuneate-oblong, acute, chartaceous. Pseudo-bulbs fusiform-cylindrical, two-leaved. Sunda Isles, 1887.

Cœlogyne—*continued.*

C. sparsa (sparse). *fl.* white; lip three-lobed, having a brown spot in front of the keels, some smaller ones on the side lobes, and a yellow spot at the base; peduncle one to four-flowered. *l.* cuneate-oblong, acute, glaucous, 3in. to 4in. long, 1in. broad. Pseudo-bulbs glaucous, fusiform. Philippines, 1883.

C. stellaris (star-like). *fl.*, sepals and petals green; lip white, marked with brown lines on the side lobes. Pseudo-bulbs tetragonal. Borneo, 1886.

COLAX HARRISONIÆ. A synonym of **Bifrenaria Harrisoniæ** (which *see*).

COLCHICUM. About thirty species, natives of Europe, West and Central Asia, and North Africa, are here included. To those described on p. 359, Vol. I., the following should now be added:

C. Troodii (Trood's). *fl.* numerous; perianth white, 1½in. in diameter, the segments narrow-oblong. Autumn. *l.* appearing in spring, 6in. to 12in. long, ⅜in. to 1in. broad, strap-shaped, obtuse, dark green. Corm depressed-globose. Cyprus, 1886. (B. M. 6901.)

COLENSOA (named in honour of the Rev. W. Colenso, who assisted Hooker in the investigation of the botany of New Zealand). ORD. *Campanulaceæ*. A monotypic genus. The species is a glabrous, erect herb, suffrutescent at base. It will thrive in sandy loam, and would probably succeed in the open air, in a warm, sheltered place. Propagated by seeds or by cuttings.

C. physaloides (Physalis-like). *fl.* very pale bluish, 1½in. long, bilabiate, the upper lip divided into two linear lobes; stamens free of the corolla tube, the filaments scarcely connate; racemes short, terminal, leafless, few-flowered. Summer. *fr.* a violet, globose berry, crowned by the linear, green calyx teeth. *l.* alternate, petiolate, elliptic-ovate, acute, doubly serrated, 4in. to 6in. long. *h.* 2ft. to 3ft. New Zealand, 1886. (B. M. 6864.)

COLOCASIA. The five species of this genus are indigenous to tropical America, one being cultivated in all warm regions. To those described on pp. 362-3, Vol. I., the following should now be added:

C. Devansayana (Devansaye's). *l.* ample, erect, peltate, ovate, acute, cordate-sagittate at base, highly glabrous, green, the sinus large, triangular; primary veins three or four on both sides, produced on the lower surface, brown; petioles elongated, terete, sheathing at base, coppery-brown. Caudex short and thick. New Guinea, 1886. (I. H. 1886, 601.)

COMPARETTIA. This genus embraces five species, natives of the Andes of South America. Sepals erecto-patent, the dorsal one free, the lateral ones connate, produced at base into a long, slender spur which is free of the petals; lip continuous with the base of the column, produced at base into two long, linear spurs, the lateral lobes rather broad, erect, the middle one spreading, very broad. To the species described on p. 366, Vol. I., the following should now be added:

C. speciosa (showy). *fl.* large and numerous; sepals and petals light orange, with a cinnabar glow; lip cinnabar, orange at base, the front lobe sub-quadrate and emarginate, about 1½in. wide, with a very short claw and a small keel between the basal auricles; spur minutely pilose, upwards of 1½in. long; racemes loose. Ecuador. A beautiful species.

CORDYLINE. The species are found in the East Indies, the Malayan Archipelago, Australia, New Zealand, and the South Pacific Islands, one being a native of Brazil. To the species and varieties described on pp. 372-5, Vol. I., the following should now be added:

C. argenteo-striata (silvery-striated). *l.* linear-lanceolate, bright green, striated and occasionally margined creamy-white, the bright green also relieved with streaks of silvery-grey. South Sea Islands, 1888. A form of *C. australis*, useful for table decoration. SYN. *Dracæna argenteo-striata.*

C. augustifolia (fine-leaved). *l.* linear-lanceolate, arching, about 1½ft. long, 1in. broad, dark green, marked and margined with crimson and rose-colour. 1883. A good table plant.

C. Bartelii (Bartel's). *l.* elliptic, reddish-bronze, bordered with red in the adult state; when young, brilliant red, flaked with brownish. 1886. A beautiful, garden variety.

C. Claudia. *l.* bronzy-green, flaked and margined with crimson 1884.

C. Diana. *l.* long-lanceolate, recurved, olive-green, margined, flaked, and striped with crimson-pink. 1883.

Cordyline—*continued.*

C. excellens (excellent). *l.* bronzy, variegated with bright rosy-red, broad, oblong, drooping. 1885. A hybrid form of *C. terminalis.*

C. Laingi (Laing's). *l.* 8in. to 10in. long, 2in. to 2½in. broad; youngest ones pale green, with broad bands and margins of creamy-white, faintly tinged rose; older ones of a deeper green, bordered with crimson and white. 1882. A free-growing hybrid, useful for decorative purposes, as it bears changes of temperature better than many other kinds.

C. madagascariensis (Madagascar). *l.* green, long and narrow, acuminate, arching. Madagascar, 1884. A distinct form, of graceful habit.

C. norwoodiensis (Norwood). *l.* banded yellow, green, and crimson, the last-named colour being chiefly confined to the marginal portion; petioles bright carmine. 1885.

C. picturata (pictured). *l.* rich olive-green, flaked and striped with pink and crimson. 1883. An attractive form.

C. placida (placid). *l.* long, narrow-lanceolate, recurved, undulated, variegated with creamy-white. 1883.

C. Plutus. *l.* bronzy-green, flaked and margined with crimson. 1884. An ornamental variety.

C. Thomsoniana (Thomson's). A fine, bold, erect plant, having a head of long, bright green leaves. West Coast of Africa, 1882. A seedling from *C. terminalis.* (F. M. n. s. 441.)

C. venosa (veined). *l.* oblong-ovate, acuminate, many-ribbed, yellow-green, blotched and reticulated with dark green. Borneo, 1883. A pretty, dwarf form.

C. Williamsii (Williams'). *l.* large, oblong-lanceolate, acute, spreading and recurved, dull green, irregularly striped with chocolate, white, rose, cinnamon, and yellow. Polynesia, 1883. A distinct plant.

CORYANTHES. Four species, all tropical American, have been referred to this genus. To those described on p. 382, Vol. I., the following variety should now be added:

C. maculata punctata (dotted). *fl.* large; sepals and petals ochre-yellow, spotted wine-purple; lip with a hood-shaped body near the base, to which a large helmet-shaped, pedunculate appendage is attached, the hood yellowish, spotted and blotched wine-purple, the pouch more heavily marked. October and November. Demerara. (B. R. 1793; W. O. A. iii. 98.)

CORYDALIS. TRIBE *Fumarieæ* of ORD. *Papaveraceæ*. Of the dozen species embraced in this genus six are North American, and the rest inhabit West Asia or the Himalayas. To those described on p. 383, Vol. I., the following—all perennials—should now be added:

C. aurea speciosa (showy). A synonym of *C. pallida.*

C. Gortschakowi (Gortschakow's). *fl.* golden-yellow, ⅜in. long; spur equalling the obtuse petals; racemes elongated, dense, terminal. *l.* bipinnatisect, the radical ones 5in. to 6in. long; segments of the lower leaves obovate-oblong, with a few deep teeth. Stem erect, leafy, very simple or branched from the base, 1ft. to 1½ft. high. Alatau and Turkestan, 1885. (R. G. 1183.)

C. pallida (pale). *fl.*, sepals very small; corolla golden-yellow, with a pale brown patch on the dorsal petal, 1in. long; racemes 1in. to 5in. long, many-flowered. March. *l.* tripinnatisect; leaflets very variable, oblong, obovate, or cuneate, variously cut. *h.* 1ft. to 1½ft. China and Japan, 1884. (B. M. 6826.) SYN. *C. aurea speciosa* (R. G. 1861, 343.)

C. Sewerzovi (Sewerzow's). *fl.* few, distant, on slender pedicels; corolla golden-yellow, with a brownish tip to the spur, the tube gibbously convex below. June. *l.* glaucous, rather fleshy, the lower ones opposite or in a false whorl, 9in. long or less, pinnatisect, petiolate; cauline ones large, sessile, broadly cuneate. *h.* 8in. to 12in. Western Turkestan, 1885. (B. M. 6896; R. G. 1077.)

CORYNOCARPUS. To the species described on p. 385, Vol. I., the following variety should now be added:

C. lævigatus aureo-marginatus (golden-margined). *l.* broadly bordered with golden-yellow. 1886. An ornamental variety, of compact habit.

CORYPHA. Of this genus about half-a-dozen species, natives of tropical Asia and the Malayan Archipelago, have been enumerated. Flowers small, hermaphrodite; spadix solitary, erect, paniculately much branched; spathes many, tubular, sheathing the peduncle and branches. To the species described on p. 386, Vol. I., the following should now be added:

C. decora (decorative). *l.* fan-shaped, divided almost to the base into linear segments ½in. broad; petioles armed with hooked prickles. 1887. An ornamental Palm. In all probability this does not belong to the genus *Corypha.*

COSTUS. All the species of this genus are tropical; they are found in America, Africa, Asia, and Australia. To those described on p. 387, Vol. I., the following should now be added:

C. musaicus (mosaic-marked). *l.* obliquely-lanceolate, 3in. to 4in. long, the centre dark green, the rest tessellated with silvery-grey. Congo, 1887.

COTONEASTER. This genus comprises about fifteen species, natives of Europe, North Africa, Central and West Asia, Siberia, the mountains of the East Indies, and Mexico. To those described on p. 387, Vol. I., the following should now be added:

C. Fontanesii (Desfontaines'). *fl.* white, disposed in small corymbs. *fr.* bright coral-red, large, round. *l.* oval-elliptic, greyish-green and glabrous above, silvery-silky beneath. Branches pubescent. 1886. This makes a round, compact bush about 3ft. high. (R. H. 1867, p. 33.)

COTYLEDON. According to Bentham and Hooker, this genus comprises about sixty species, natives of West and South Europe, Africa, East Asia, the Himalayas, and Mexico. To those described on pp. 388-90, Vol. I., the following should now be added:

C. edulis (edible). *fl.* white, Sedum-like, six to seven lines in diameter, shortly pedicellate, arranged along the upper side of the flexuose, spreading branches of the cymose panicles. *l.* nearly terete or obtusely trigonal, erect, whitish or glaucous-green, but without mealiness. Stems very short, thick. California (on dry banks near the sea in San Diego), 1883. The young leaves are eaten by the Indians. SYN. *Sedum edulis.*

CRASSULA. Leaves opposite, rarely petiolate, often connate, fleshy, entire and cartilaginous-margined, glabrous, pubescent, or scaly. To the species described on pp. 391-2, Vol. I., the following should now be added:

C. impressa (marked). *fl.* disposed in loose, dichotomously-branched corymbs; petals white at base, red above, free, elliptic-oblong; peduncles and pedicels glabrous. *l.*, radical ones crowded, somewhat rosulate, oblong, linear-lanceolate, or nearly linear; cauline ones linear, opposite; all succulent, glabrous, and, as well as the stems, more or less suffused with purple. Stems tufted, 2in. to 3½in. long. 1886. SYN. *C. Schmidti* (R. G. 1225).

C. rhomboidea (rhomboid). *fl.* pale flesh-coloured; cymes short-stalked, terminal, few-flowered, ¾in. to 1in. across. *l.* rhomboidal, hunched above the middle, sub-acute, ¼in. to ½in. thick, glaucous, dotted. *h.* 2in. to 3in. Transvaal, 1886. Plant glabrous. Of botanical interest.

C. Schmidti (Schmidt's). A synonym of *C. impressa.*

CRATÆGUS. To the species and varieties described on pp. 393-4, Vol. I., the following should now be added:

C. Bruanti (Bruant's). A synonym of *C. Oxyacantha semperflorens.*

C. Carrièrei (Carrière's). *fl.* at first white, subsequently becoming flesh-coloured. Spring. *fr.* bright red, resembling cherries, persistent throughout the winter. 1883. A handsome tree, of garden origin. (R. H. 1883, 108.) *C. Lavallèi* is very similar to, if not identical with, *C. Carrièrei.*

C. Lavallèi (Lavallé's). *See* **C. Carrièrei.**

C. Oxyacantha foliis-tricoloribus (three-coloured-leaved). *l.* variegated with different shades of dark red, carmine, and rose. 1886. An ornamental, garden variety.

C. O. semperflorens (ever-flowering).* A useful, garden variety, flowering throughout the summer: towards autumn, plants may be seen with nearly ripe fruit, green fruit, and open flowers at the same time. SYN. *C. Bruanti.*

C. pinnatifida (pinnatifid). *fl.* white, in erect, somewhat pointed corymbs; peduncles and base of calyx sparingly beset with shaggy hairs. *l.* broadly oval, divided on each side into from two to four long, pointed, toothed lobes, glabrous above, hairy on the nerves beneath. A tall, thorny bush. The earliest of all the Thorns to come into leaf. (R. G. 366.)

C. p. major (greater).* *fl.* white, large, corymbose. *fr.* bright red, pear-shaped, ⅝in in diameter. *l.* long-stalked, lobed, and pinnatifid. North China, 1886. An ornamental form. (G. C. n. s., xxvi., p. 621.)

C. Pyracantha Lelandi (Leland's).* *fr.* bright orange-scarlet, produced when the plant is but a few inches in height. 1888.

CRINUM. Of this genus seventy-nine species are described by Baker, in his "Handbook of the *Amaryllideæ*"; they are broadly dispersed over the tropical and sub-tropical regions of the globe. Flowers numerous in an umbel, large, sessile or shortly pedicellate; stamens affixed to the throat. Leaves often numerous, long, narrow or rather broad. To the species described on

Crinum—*continued.*

pp. 396-7, Vol. I., the following should now be added. Except where otherwise stated, stove treatment is required:

C. amabile augustum (august). A synonym of *C. augustum.*

C. angustifolium blandum (charming). *fl.*, perianth segments broader than in the type; filaments whitish. *l.* also broader. SYN. *C. blandum* (B. M. 2531).

C. a. confertum (clustered). *fl.* sessile; perianth segments 4in. long, a little exceeding the tube.

C. anomalum (anomalous). A form of *C. asiaticum.*

C. blandum (charming). A variety of *C. angustifolium.*

C. Broussonetii (Broussonet's). A synonym of *C. yuccæfolium.*

C. Colensoi (Colenso's). A garden synonym of *C. Moorei.*

C. confertum (clustered). A variety of *C. angustifolium.*

C. crassipes (thick-stalked). *fl.* fifteen to twenty in an umbel; perianth tube green, curved, 3in. long, the limb sub-erect, 2½in. long, the segments white, ½in. broad, with a pink keel; pedicels 1in. to 1½in. long; peduncle compressed, less than 1ft. long, ¾in. thick. July. *l.* lorate, bright green, sub-erect, 4in. broad. Bulb very large, conical. Tropical or sub-tropical Africa (?), 1887. Stove or intermediate.

C. cruentum Loddigesii (Loddiges'). *fl.*, perianth segments tipped dark purple; pedicels as long as the ovary.

C. declinatum (declinate). A form of *C. asiaticum.*

C. distichum (two-ranked). *fl.* usually solitary, sessile; perianth tube curved, 5in. to 6in. long, the limb horizontal, about 4in. long, the segments keeled bright red, oblong, acute, connivent, 1in. broad; stamens and style nearly reaching the tips of the segments: peduncle about 1ft. long. June. *l.* about ten, distichous, linear, firm, channelled down the face, tapering, 1ft. long. Bulb small, globose. Sierra Leone. SYN. *Amaryllis ornata* (B. M. 1753).

C. elegans (elegant). A variety of *C. pratense.*

C. ensifolium (ensate-leaved). A variety of *C. defixum.*

C. flaccidum (flaccid). *fl.* six to eight in an umbel; perianth tube 3in. to 4in. long, usually curved, the segments pure white, oblong-lanceolate, about as long as the tube, ¾in. broad, acute; stamens much shorter than the segments; pedicels 1in. to 1½in. long; peduncle 1½ft. to 2ft. long, much compressed. July. *l.* linear, 1½ft. to 2ft. long, 1in. to 1½in. broad. Bulb ovoid, 3in. to 4in. in diameter, with a very short neck. New South Wales and South Australia. Greenhouse. (B. M. 2133.) SYN. *Amaryllis australasica* (B. R. 426).

C. Hildebrandtii (Hildebrant's). *fl.*, perianth pure white, erect; tube 6in. to 7in. long; limb segments horizontally spreading, 2in. to 3in. long, less than ¼in. broad; umbel six to ten-flowered; peduncle ancipitous, about 1ft. long. Winter. *l.* eight or ten, contemporary with the flowers, lanceolate, firm, 1½ft. to 2ft. long. Bulb 2in. to 3in. in diameter; neck 6in. long. Comoro Islands. (B. M. 6709; I. H. 1886, 115.)

C. humile (dwarf). *fl.* six to nine in an umbel, cernuous in bud; perianth tube greenish, 3in. long, the segments white, linear-lanceolate, spreading, 2in. long, ¼in. broad; filaments bright red, rather longer than the perianth segments; pedicels short; peduncle slender, 1ft. long. October. *l.* linear, 1ft. long, spreading, sub-acute, thicker than in *C. amœnum*, pitted over the face. Bulb small, globose, greenish, with a very short neck. Tropical Asia, 1826. (B. M. 2636.)

C. insigne (remarkable). A slight variety of *C. latifolium.*

C. leucophyllum (white-leaved). *fl.* pinkish, fragrant, forty or fifty in a dense, centripetal umbel; perianth tube cylindrical, 3in. long, the segments linear, spreading, rather shorter than those of the tube; scape springing from below the leaves, 1ft. long. August. *l.*, produced ones about twelve or fourteen, arranged in a distichous column about 1ft. long, lanceolate, 1½ft. to 2ft. long, 5in. to 6in. broad, whitish-green, denticulate. Bulb nearly 6in. in diameter. Damara-land, 1880. (B. M. 6783.)

C. lineare (linear). *fl.* five or six in an umbel; perianth tube slender, curved, 1½in. to 2½in. long, the segments tinged red outside, oblanceolate, acute, 2in. to 3in. long, ½in. to ¾in. broad; pedicels ⅓in. to ⅔in. long; peduncle slender, sub-terete, 1ft. long. September. *l.* linear, 1½ft. to 2ft. long, ½in. broad, glaucous-green, channelled down the face. Bulb small, ovoid. Cape Colony. SYNS. *Amaryllis revoluta* (B. M. 915), *A. r. gracilior* (B. M. 623).

C. Loddigesii (Loddiges'). A variety of *C. cruentum.*

C. longifolium Farinianum (Farini's). *fl.* five or six in an umbel; perianth tube greenish, 3½in. to 4in. long, the segments pink, connivent in a narrow funnel, 3in. long; scape 2ft. high. *l.* ensiform, 3ft. to 4ft. long, acuminate, glaucescent, entire. Bulb 2½in. to 3in. in diameter, narrowed into a neck 6in. long. 1887.

C. Mackenii (Macken's). A garden synonym of *C. Moorei.*

C. Massaiana (Duc de Massa's). *fl.* white, each perianth segment having a central stripe of dull rose-colour. 1887. (I. H.

Crinum—*continued.*

1887, 55, under name of *Brunsvigia Massaiana.*) This "is no doubt a Crinum, nearly allied to *C. Kirkii*" (J. G. Baker).

C. moluccanum (Moluccas). A slight variety of *C. latifolium.*

C. Moorei Schmidtii (Schmidt's). A form with pure white flowers. SYN. *C. Schmidtii* (R. G. 1072).

C. natalense (Natal). A garden synonym of *C. Moorei.*

C. plicatum (folded). A form of *C. asiaticum.*

C. Powellii (Powell's).* *fl.* about eight in an umbel; perianth tube greenish, curved, 3in. long, the segments reddish, oblanceolate, acute, 4in. long, 1in. broad; stamens much shorter than the perianth segments; peduncle compressed, glaucous, 2ft. long. *l.* about twenty, spreading, ensiform, acuminate, bright green, 3ft. to 4ft. long, 3in. to 4in. broad low down. Bulb globose, with a short neck. A garden hybrid between *C. longifolium* and *C. Moorei.* Hardy in the South of England.

C. pratense (meadow-loving). *fl.* six to twelve in an umbel; perianth tube greenish, 3in. to 4in. long, at first curved, the segments white, lanceolate, nearly or quite as long as the tube, ½in. broad; filaments bright red, rather shorter than the segments; pedicels none or very short; peduncle lateral, 1ft. or more in length. June. *l.* six to eight to a bulb, linear, sub-erect, 1½ft. to 2ft. long, 1½in. to 2in. broad, narrowed to the point, channelled on the face. Bulb ovoid, 4in. to 5in. in diameter, with a short neck. India, 1872.

C. p. elegans (elegant). *fl.*, perianth tube 1in. shorter than the segments; peduncle decumbent. Bulb with a longer neck than in the type. SYN. *C. elegans* (B. M. 2592).

C. procerum (tall). A form of *C. asiaticum.*

C. Sanderianum (Sander's). *fl.* sessile, borne in umbels of three or four together; perianth segments white, with a broad, conspicuous band of reddish-crimson down the centre, lanceolate, spreading-recurved. *l.* ensiform, 1ft. to 1½ft. long. Bulb globose, 2in. in diameter. Sierra Leone, 1884. A beautiful plant. (F. & P. 1884, p. 156.)

C. Schmidtii (Schmidt's). A form of *C. Moorei.*

C. sinicum (Chinese). A form of *C. asiaticum.*

C. speciosum (showy). A slight variety of *C. latifolium.*

C. spirale (spiral). A synonym of **Carpolyza spiralis** (which *see*, on p. 272, Vol. I.).

C. strictum (straight). *fl.* about four in an umbel; perianth tube pale green, sub-erect, about 5in. long, the segments white, lanceolate, 3in. to 4in. long, ½in. broad; filaments red, 1in. shorter than the segments; pedicels none or very short; peduncle green, twice as long as the leaves. September. *l.* lorate, pale green, sub-erect, 1ft. long, 2in. to 2½in. broad. Bulb small, ovoid, without any distinct neck. Origin unknown. (B. M. 2635.)

C. sumatranum (Sumatra). *fl.* ten to twenty in an umbel; perianth tube greenish, erect, 3in. to 4in. long, the segments not tinged red outside, linear, as long as the tube; filaments bright red, much shorter than the segments; pedicels very short; peduncle much shorter than the leaves. July. *fr.* as large as a man's fist, one to three-seeded. *l.* ensiform, sub-erect, 3in. to 4in. broad, gradually narrowed to a point, firm, dark, dull green, the edges serrulated. Bulb ovoid, as large as in *C. asiaticum.* Sumatra. (B. R. 1049.)

C. undulatum (wavy). *fl.* four in an umbel; perianth tube greenish, 7in. to 8in. long, curved before the flower expands, the segments not purple outside, lanceolate, undulated, erecto-patent, 3in. long; filaments bright red, 2in. long; pedicels none or very short; peduncle 1ft. long. November. *l.* dark green, ensiform, firm, sub-erect, 1½ft. long, 1in. broad. Bulb small, ovoid, with a long neck. North Brazil. (H. E. F. 200.)

C. vanillodorum (Vanilla-scented). A synonym of *C. giganteum.*

C. variabile (variable). *fl.* ten to twelve in an umbel; perianth tube greenish, curved, 1½in. to 2in. long, the segments flushed red down the back, oblong, acute, 2½in. to 3½in. long; filaments red, 1in. shorter than the segments; pedicels ½in. to 1in. long; peduncle erect, compressed, 1ft. to 1½ft. long. April. *l.* ten to twelve to a bulb, linear, green, weak, 1½ft. to 2ft. long, 2in. broad. Bulb ovoid, 3in. to 4in. in diameter, with a short neck. Cape Colony. SYN. *C. v. roseum* (B. R. 1844, 9), *Amaryllis revoluta robustior* (B. R. 615).

C. v. roseum (rosy). A synonym of *C. variabile.*

C. yuccæflorum (Yucca-flowered). *fl.* one or two in an umbel, sessile; perianth tube greenish, curved, 4in. to 5in. long, the limb horizontal, 3in. to 4in. long, the segments oblong, acute, connivent, banded red on the back; filaments 1in. shorter than the segments; peduncle slender, 1ft. long. June. *l.* ten to twelve to a bulb, multifarious, linear, firm, 1ft. to 1½ft. long, about 1in. broad. Bulb small, globose, purplish. Sierra Leone, 1785. SYNS. *C. Broussonetii* (B. M. 2121; L. B. C. 668), *C. yuccæoides, Amaryllis spectabilis* (A. B. R. 390).

C. yuccæoides (Yucca-like). A synonym of *C. yuccæflorum.*

C. zeylanicum reductum (reduced). *fl.* about four in an umbel, sessile; perianth white, with a red, central stripe on each segment; scape lateral, less than 1ft. long. *l.* ensiform, spreading, 1ft. to 1½ft. long, 1½in. to 1¾in. broad, gradually narrowed from middle to apex, the edges not ciliated. Zanzibar, 1884.

CROCUS. The information here given is based upon Mr. George Maw's magnificent "Monograph of the Genus *Crocus*," published in 1886. By the assistance of the following "key" to the grouping of the Crocuses in cultivation, the name of any species may be the more readily determined. The number of species described by Mr. Maw is sixty-seven: of these about seventeen are lost to cultivation, or await introduction to this country. *C. aërius, C. ancyrensis, C. Fleischeri, C. nevadensis,* and *C. ochroleucus* require a cold frame to bring them to perfection.

Division I. Involucrati.

Species with a basal spathe springing at the base of the scape from the summit of the corm.

SECTION I. FIBRO-MEMBRANACEI,

With a corm-tunic of membranous tissue, or of membranous tissue interspersed with nearly parallel fibres.

AUTUMN-FLOWERING. *asturicus, Cambessedesii, Clusii, iridiflorus, karduchorum, nudiflorus, ochroleucus, Salzmanni, Scharojani, vallicola, zonatus.*

SPRING-FLOWERING. *Imperati, Malyi, minimus, suaveolens, versicolor.*

SECTION II. RETICULATI,

With a corm-tunic of distinctly reticulated fibres.

SPRING-FLOWERING. *banaticus, corsicus, etruscus, Tommasinianus, vernus.*

AUTUMN-FLOWERING. *hadriaticus, longiflorus, medius, sativus.*

Division II. Nudiflori.

Species without a basal spathe.

SECTION I. RETICULATI,

With a corm-tunic of distinctly reticulated fibres.

AUTUMN-FLOWERING. *cancellatus.*

SPRING-FLOWERING. *ancyrensis, carpetanus, dalmaticus, gargaricus, reticulatus, Sieberi, susianus.*

SECTION II. FIBRO-MEMBRANACEI,

With a corm-tunic of membranous tissue, or of membranous tissue interspersed with nearly parallel fibres.

SPRING-FLOWERING. LILAC OR WHITE: *alatavicus, hyemalis, nevadensis.*

AUTUMN-FLOWERING. LILAC OR WHITE. *Boryi, lævigatus, Tournefortii.*

SPRING-FLOWERING. *aureus, Balansæ, Biliottii, Korolkowi, Olivieri, Suterianus, vitellinus.*

SECTION III. ANNULATI.

Basal tunic of corm separating into annuli.

SPRING-FLOWERING. *aërius, biflorus, chrysanthus, Danfordiæ.*

AUTUMN-FLOWERING. *pulchellus, speciosus.*

SECTION IV. INTERTEXTI.

With a corm-tunic of stranded or platted fibres.

SPRING-FLOWERING. *Fleischeri.*

C. Adami (Adam's). A variety of *C. biflorus.*

C. aërius (aërial). *fl.*, perianth tube pale lilac, 2in. long; segments bright lilac, obovate or oblong, obtuse, 1in. to 1½in. long; throat bright yellow: proper spathe of two lanceolate, hyaline valves. Spring. *l.* but little developed at the flowering season, narrow-linear, with revolute margins and a distinct white rib down the face; basal spathe none. Corm globose, ½in. to ¾in. in diameter, the tunics brown. Asia Minor, 1885. (B. M. 6852 B; M. C. 58.)

C. algeriensis (Algeria). A synonym of *C. nevadensis.*

C. ancyrensis (Angora). *fl.*, perianth tube orange or purple, about 3in. long; throat unbearded; segments rich orange, ovate-lanceolate, ¾in. to 1in. long, ½in. broad. Spring. *l.* three or four, produced to 1ft. in length, glabrous, $\frac{1}{10}$in. broad; sheathing ones about four, ½in. to 3in. long. Corm pyriform, ¾in. broad, 1in. high. Angora, 1879. (M. C. 38.)

C. asturicus (Asturias). *fl.*, perianth tube 4in. to 5in. long; throat violet, bearded; segments violet or purple, with a few darker lines towards the base, very variable, rarely white, 1½in. to 1¾in. long, ½in. to ⅝in. broad. September to November. *l.* four or five, about 1ft. long, $\frac{3}{16}$in. broad, glabrous; sheathing ones four or five, ½in. to 2½in. long. Corm ⅝in. broad, ½in. to ⅝in. high. Asturias and Sierra de Guadarrama, North Spain. (M. C. 7.)

C. atlanticus (Atlantic). A synonym of *C. nevadensis.*

C. Balansæ (Balansa's). *fl.*, perianth tube 2in. to 2½in. long; throat glabrous; segments orange, 1¼in. long, ¼in. to ½in. broad, the outer surface of the outer ones feathered bronze or evenly

Crocus—*continued.*

suffused rich brown. March. *l.* appearing before and with the flowers, about 10in. long, $\frac{1}{16}$in. broad, ciliated on the margins of the keel and blade; sheathing ones about three, $\frac{1}{2}$in. to 2$\frac{1}{2}$in. long. Corm pyriform, $\frac{3}{4}$in. broad and deep. Western Asia Minor. (M. C. 51).

C. banaticus (South Hungarian). *fl.*, perianth tube violet, 3in. long; throat white internally, unbearded; segments 1$\frac{1}{2}$in. long, $\frac{3}{8}$in. broad, the inner ones rich, bright purple, with darker purple markings near the summit, paler than the outer, varying to white, or variegated purple and white. March. *l.* about three, 1$\frac{1}{4}$ft. long, $\frac{3}{8}$in. broad, glabrous, the lateral channels wide and open; sheathing ones about four, $\frac{1}{2}$in. to 3in. long. Hungary, &c. (M. C. 24.) SYN. *C. veluchensis*, of gardens (?B. M. 6197). The following are forms of this species: *albiflorus*, *concolor*, *niveus*, *pictus*, and *versicolor*.

C. Biliottii (A. Biliotti's). *fl.*, perianth tube about 3in. long; throat glabrous; segments rich purple, with a darker blotch at the base, about 1in. long, $\frac{1}{2}$in. broad. January to March. *l.* about three, 10in. long, $\frac{1}{8}$in. broad, glabrous, the lateral channels wide and open; sheathing ones three or four, $\frac{1}{2}$in. to 3in. long. Corm $\frac{1}{2}$in. to $\frac{1}{2}$in. broad, $\frac{1}{2}$in. high. Trebizond. (M. C. 56 B.)

C. Boryi lævigatus (smooth). A synonym of *C. lævigatus*.

C. B. marathoniseus (Marathon). *fl.*, stigmas less branching than in the type, and only reaching to the level of the summit of the anthers. (M. C. 47 B, f. 4.)

C. Cambessedesii (Cambessedes'). *fl.*, perianth tube 2$\frac{1}{2}$in. to 3in. long; throat white internally, unbearded; segments vinous-lilac or white, $\frac{3}{4}$in. long, $\frac{1}{2}$in. broad, the outer ones buff on the outside, feathered purple. September to March. *l.* two or three, 5in. to 6in. long, $\frac{1}{16}$in. broad, glabrous; sheathing ones about four, 1$\frac{1}{2}$in. long. Corm pyriform, about $\frac{3}{4}$in. broad and high. Balearic Islands. (M. C. 13; B. R. xxxi. 37, f. 4, under name of *C. Cambessedesianus*.)

C. cancellatus (cross-barred). *fl.*, perianth tube 4in. to 5in. long; throat yellow, unbearded; segments varying from white to light purple, self-coloured or purple-feathered, 1$\frac{1}{2}$in. to 1$\frac{1}{2}$in. long, $\frac{1}{2}$in. broad; proper spathe 12in. long. September to December. *l.* four or five, glabrous, 10in. to 12in. long, $\frac{1}{16}$in. broad, the keel prominent; sheathing ones about four, $\frac{1}{2}$in. to 3in. or 4in. long. North Palestine to Armenia. (M. C. 31.)

C. c. cilicicus (Cilician). *fl.*, proper spathe shorter than in the type, completely hidden by the sheathing leaves.

C. c. Mazziaricus (Mazziari's). *fl.* white, with a bright golden-orange throat.

C. carpetanus (Toledo). *fl.*, perianth tube about 3in. long; throat white, unbearded; segments varying from delicate vinous-lilac, darker on the margins, to white, and suffused externally towards the base with bluish veins, 1in. to 1$\frac{1}{4}$in. long, $\frac{3}{8}$in. broad. February to April. *l.* about four, 8in. long, $\frac{1}{16}$in. broad, semi-cylindrical, without keel or lateral channels; sheathing ones about four, $\frac{1}{2}$in. to 3$\frac{1}{2}$in. long. Spain and Portugal, 1879. (M. C. 41.)

C. Cartwrightianus (Cartwright's). A variety of *C. sativus*.

C. chrysanthus (golden-flowered), of Herbert in B. R. xxxiii. 4, f. 1. A synonym of *C. Suterianus*.

C. Clusii (Clusius'). *fl.*, perianth tube 3in. to 4in. long; throat white internally, distinctly bearded; segments light purple, darker towards the base, with no feathering, 1$\frac{1}{2}$in. long, $\frac{1}{2}$in. broad. September to December. *l.* five or six, 9in. to 10in. long, $\frac{1}{16}$in. to $\frac{1}{16}$in. broad, glabrous, the margins bearing three prominent ridges; sheathing ones three or four, the longest 2in. to 3in. long. Corm $\frac{3}{4}$in. to $\frac{3}{4}$in. broad, about $\frac{3}{4}$in. high. Western Spain and Portugal. (M. C. 10.)

C. corsicus (Corsican). *fl.*, perianth tube 2in. to 2$\frac{1}{2}$in. long; throat white or lilac inside, unbearded; segments pale purple, broadly lanceolate, about 1$\frac{1}{2}$in. long, $\frac{1}{2}$in. broad, the outer surface of the outer ones coated buff and feathered purple. April. *l.* three or four, 8in. long, $\frac{1}{16}$in. broad, the lateral channels wide and open; sheathing ones two to four, $\frac{1}{2}$in. to 2$\frac{1}{2}$in. long. Corm $\frac{1}{2}$in. to $\frac{3}{4}$in. broad, barely $\frac{1}{2}$in. high. Corsica, 1843. (M. C. 21.) SYN. *C. insularis* (B. R. xxix. 21).

C. dalmaticus (Dalmatian). *fl.*, perianth tube about 2in. long; throat yellow, unbearded; segments generally lilac, 1$\frac{1}{2}$in. long, $\frac{3}{8}$in. to $\frac{1}{2}$in. broad, the outer surface of the outer ones buff, with a few purple veins towards the base, or delicately feathered purple. February and March. *l.* three to six, 8in. to 9in. long, $\frac{1}{2}$in. broad, glabrous, the keel convex; sheathing ones about three, $\frac{1}{2}$in. to 2in. long. Corm pyriform, $\frac{1}{2}$in. to $\frac{3}{4}$in. broad and high. Dalmatia. (M. C. 34.)

C. Danfordiæ (Mrs. Danford's). *fl.*, perianth tube 2$\frac{1}{2}$in. long; throat unbearded; segments pale sulphur-yellow, about $\frac{3}{4}$in. long, $\frac{3}{8}$in. broad, the outer surface of the outer ones occasionally suffused brown. February and March. *l.* three or four, 12in. to 14in. long, $\frac{1}{16}$in. broad, ciliated on the margins of the keel and blade; sheathing ones about four, $\frac{1}{2}$in. to 3in. long. Corm about $\frac{1}{2}$in. broad and high. Yar-puz, Anti-Taurus, 1879. (M. C. 63.)

C. Elwesii (Elwes'). A variety of *C. sativus*.

C. estriatus (not striated). A form of *C. biflorus*.

Crocus—*continued.*

C. etruscus (Etruscan). *fl.*, perianth tube striped lilac, 2in. to 3in. long; throat yellow; segments bright lilac-purple inside, 1in. to 1$\frac{1}{2}$in. long, the three outer ones having five lilac stripes down the back. March. *l.* two to six, narrow-linear, with a white, central band, the edges revolute. Corm $\frac{3}{4}$in. to $\frac{3}{4}$in. broad, rather less in height. Italy, 1877. (B. M. 6362; M. C. 22.)

C. Fleischeri (Fleischer's).* *fl.*, perianth tube about 3in. long; throat pale yellow, unbearded; segments white, linear-lanceolate, acute, 1in. to 1$\frac{1}{4}$in. long, barely $\frac{1}{2}$in. broad, the outer surface of the outer ones and the tube veined rich purple. Early spring. *l.* four or five, 1ft. long, $\frac{1}{16}$in. to $\frac{1}{8}$in. broad, glabrous; sheathing ones about five, $\frac{1}{2}$in. to 3in. or 4in. long. Corm yellow, $\frac{1}{2}$in. to $\frac{3}{4}$in. broad and high, producing bulbils or cormlets at its base. Western Asia Minor. (M. C. 66.)

C. fulvus (fulvous). A variety of *C. susianus*.

C. gargaricus (Mount Gargarus). *fl.*, perianth tube nearly 3in. long; throat unbearded; segments rich orange, unstriped, about 1$\frac{1}{2}$in. long, barely $\frac{1}{2}$in. broad. Early spring. *l.* about three, 7in. to 8in. long, $\frac{1}{16}$in. broad, glabrous, the margins revolute, the lateral channels broad and open; sheathing ones two to four, $\frac{1}{2}$in. to 2$\frac{1}{2}$in. long. Corm about $\frac{1}{2}$in. broad, and nearly as high. Mount Gargarus. (M. C. 39.)

C. hadriaticus (Adriatic). *fl.*, perianth tube 3in. to 4in. long; throat white or purple, bearded; segments pure white, or purple towards the base, ovate-lanceolate, 1$\frac{1}{2}$in. long, $\frac{3}{8}$in. broad. October. *l.* five or six, 1$\frac{1}{2}$ft. long, one line broad, ciliated on the margins and keel, the lateral channels narrow, the reflected margins of the blade nearly meeting the margins of the keel; sheathing ones six or seven, $\frac{1}{2}$in. to 3$\frac{1}{2}$in. long. Corm about 1in. broad and $\frac{3}{4}$in. high. Albania, Ionian Islands, &c. (M. C. 30, f. 1, 2.)

C. h. chrysobelonicus (Chrysobeloni). *fl.*, throat of the perianth yellow. (M. C 30, f. 3.)

C. Haussknechtii (Hausknecht's). A variety of *C. sativus*.

C. hyemalis (winter). *fl.*, perianth tube about 2in. long; throat yellow, unbearded; segments white, veined rich purple towards the base, about 1$\frac{1}{2}$in. long and $\frac{1}{2}$in. broad; anthers orange. November to January. *l.* four to seven, 1$\frac{1}{2}$in. to 1$\frac{1}{2}$in. long, $\frac{1}{16}$in. broad, glabrous, the lateral channels without ridges; sheathing ones about four, $\frac{1}{2}$in. to 2$\frac{1}{2}$in. long. Corm $\frac{1}{2}$in. to $\frac{3}{4}$in. broad and high. Palestine and Syria. (M. C. 43, f. 1-7.)

C. h. Foxii (H. Fox's). *fl.*, outer surface of the outer perianth segments freckled and suffused purple; anthers black. (M. C. 43, f. 8, 9.)

C. insularis (insular). A synonym of *C. corsicus*.

C. karduchorum (Kurdish). *fl.*, perianth tube 2in. to 3in. long; segments vinous-lilac, 1in. to 1$\frac{1}{2}$in. long, five lines broad. September. *l.* glabrous, dormant at the flowering time, when produced 1$\frac{1}{2}$in. to 2in. long, $\frac{1}{16}$in. broad, persistent till the next flowering period, when the two sets of leaves exist together; sheathing ones four or five, about 1in. long. Corm nearly spherical, $\frac{1}{2}$in. to $\frac{3}{4}$in. broad and high. Kurdistan, 1886. (M. C. 5.)

C. Korolkowi (Korolkow's). *fl.*, perianth tube brownish, 2in. long; segments bright yellow inside, oblanceolate-oblong, 1in. to 1$\frac{1}{2}$in. long, the three outer ones tinged with brown all over the back; spathe valves two, 1in. long. Spring. *l.* eight to twelve to a cluster, reaching to the top of the flowers, narrow-linear, with revolute margins and a distinct, white, central band down the face; basal spathe none. Corm depressed-globose, 1in. in diameter; outer tunics brown. Central Asia, 1885. (B. M. 6852 A; M. C. 56.)

C. lævigatus (smooth). *fl.*, perianth tube 3in. long; throat glabrous; segments varying from white to lilac, 1$\frac{1}{2}$in. to 1$\frac{1}{2}$in. long, $\frac{1}{2}$in. broad, the outer surface of the outer ones either self-coloured buff or more generally feathered or suffused rich purple. October to Spring. *l.* four or five, appearing before the flowers, 9in. to 10in. long, $\frac{1}{16}$in. to $\frac{1}{8}$in. broad, glabrous, the lateral channels without ridges; sheathing ones three, $\frac{1}{2}$in. to 2$\frac{1}{2}$in. long. Corm pyriform, $\frac{3}{4}$in. broad and high; tunic glabrous. Morea, &c. (M. C. 49.) SYN. *C. Boryi lævigatus*.

C. longiflorus (long-flowered). *fl.*, perianth tube yellow, about 4in. long; throat orange, slightly bearded; segments of a uniform, pale vinous-lilac, yellow towards the base, or externally veined or feathered purple, 1$\frac{1}{2}$in. long, $\frac{1}{2}$in. to $\frac{3}{4}$in. broad. October and November. *l.* about three, appearing with the flowers, 8in. to 9in. long, $\frac{1}{16}$in. broad, the lateral channels broad and open; sheathing ones about five, $\frac{1}{2}$in. to 3in. long. Corm nearly spherical, $\frac{1}{2}$in. to $\frac{3}{4}$in. in diameter. South Italy, Sicily, &c., 1843. (B. R. xxx. 3, f. 4; M. C. 28.)

C. Malyi (Maly's). *fl.*, perianth tube yellow, about 3in. long; throat orange, bearded; segments white, orange towards the throat, occasionally suffused externally with vinous-purple towards the throat, ovate-lanceolate, 1$\frac{1}{2}$in. to 1$\frac{1}{2}$in. long. March. *l.* four or five, appearing with the flowers, 1$\frac{1}{2}$ft. long, $\frac{1}{16}$in. to $\frac{1}{8}$in. broad, glabrous, the lateral channels wide and open, containing three low ridges; sheathing ones six or seven, $\frac{1}{2}$in. to 4in. long. Corm oblate, $\frac{3}{4}$in. broad, $\frac{1}{2}$in. to $\frac{1}{2}$in. high. Monte Vermaz. (M. C. 18.)

C. marathoniseus (Marathon). A variety of *C. Boryi*.

Crocus—*continued.*

C. medius (intermediate). *fl.*, perianth tube 4in. to 5in. long; throat nearly white, internally veined purple, unbearded; segments bright purple, internally veined towards the base with dark purple, ovate-lanceolate, 2in. long, ⅜in. to ⅝in. broad, the inner ones somewhat shorter than the outer ones. October and November. *l.* two or occasionally three, 10in. to 12in. long, $\frac{1}{16}$in. broad, the margins of keel and blade slightly ciliated, the lateral channels broad and open, containing three low ridges; sheathing ones about five, ½in. to 3in. long. Corm a little broader than high, ⅝in. in diameter under cultivation, much smaller in the wild state. Riviera, 1843. (B. R. xxxi. 37, f. 5; F. M. 20; Gn. xiv. 153, f. 10; M. C. 27.)

C. minimus (least). *fl.*, perianth tube 1½in. to 2in. long; throat white or lilac, unbearded; segments deep, rich purple, 1in. to 1½in. long, ½in. broad, the outer surface of the outer ones coated buff and feathered dark purple, occasionally white or self-coloured purple. April. *l.* three or four, appearing before the flowers, 8in. to 9in. long, one line broad, glabrous; sheathing ones about three, 1in. to 2½in. long, including several scapes. Corm pyriform, fully ½in. broad and high. Corsica. An attractive little plant. (B. M. 6176; M. C. 19.)

C. minimus (least), of B. M. 2991. A synonym of *C. biflorus.*

C. nevadensis (Sierra Nevada). *fl.*, perianth tube 2½in. to 3in. long; throat pale yellow, bearded; segments pale lilac or white, the outer surface variously feathered or veined purple, 1in. to 1½in. long, ½in. broad. January. *l.* four or five, appearing with the flowers, 1ft. long, $\frac{1}{12}$in. to $\frac{1}{16}$in. broad, glabrous, channelled with six alternating ridges and furrows; sheathing ones about four, ⅜in. to 4in. long. Corm ⅜in. to ⅝in. broad, ½in. to ⅝in. high. Spain and Algeria. (M. C. 42.) Syns. *C. algeriensis, C. atlanticus.*

C. nubigenus (cloud-born). A form of *C. biflorus.*

C. ochroleucus (yellow and white). *fl.*, perianth tube pale buff, 3½in. long; throat orange, slightly bearded; segments pale cream-colour, suffused orange towards the base, about 1½in. long and ½in. broad. Late autumn. *l.* four to six, glabrous, appearing before the flowers, 10in. to 12in. long, nearly ¼in. broad, the lateral channels wide and open; sheathing ones about six, ½in. to 2½in. long. Corm oblate, 1in. broad, ½in. high. North Palestine and Syria. (B. M. 5297; M. C. 11.)

C. Olivieri (Olivier's). *fl.*, perianth tube 1½in. to 2in. long; throat glabrous; segments bright orange, obtuse, 1in. to 1½in. long, about ½in. broad. Spring. *l.* three or four, appearing with the flowers, 1ft. long, ⅛in. broad, the lateral channels wide and open, the margins of the keel and blade ciliated; sheathing ones about four, ½in. to 3½in. long. Corm ½in. to ⅝in. broad and high, nearly spherical. Greece, &c. (B. M. 6031; M. C. 53.)

C. Orsinii (Orsini's). A variety of *C. sativus.*

C. Pallasii (Pallas'). A variety of *C. sativus.*

C. Salzmanni (Salzmann's). *fl.*, perianth tube 3in. to 4in. long; throat yellowish, bearded; segments vinous-lilac, occasionally white, about 2in. long and ⅝in. broad, the outer surface of the outer ones feathered purple. Autumn. *l.* six or seven, developed before the flowers, 1ft. to 1½ft. long, about ⅛in. broad, glabrous, the keel narrow and prominent; sheathing ones three or four, ½in. to 2in. long. Corm oblate, 1in. to 1½in. broad, ⅝in. high. Tangier, Spain, &c. (B. M. 6000; M. C. 9; B. R. 4, f. 4, under name of *C. Salzmannianus.*)

C. Scharojani (Scharojan's). *fl.* orange; perianth tube 4in. to 5in. long; throat unbearded; segments lanceolate, 1½in. to 1⅝in. long, four to five lines broad, the inner ones rather shorter than the outer. July and August. *l.* three, dormant at flowering time, produced to 10in. in length, broad, glabrous, the convex keel as broad as the concave blade, the blade without the usual white band, often persistent till the ensuing flowering period; sheathing ones three or four, ¼in. to 1⅝in. long. Corm small, globose or depressed-globose, ½in. broad, ½in. high. Circassia and Armenia. (M. C. 3; R. G. 578, f. 2, a-c.)

C. suaveolens (sweetly-scented). *fl.*, perianth tube 3in. to 4in. long; throat bright orange, unbearded; segments lilac, narrow-lanceolate, acute, 1½in. long, ⅝in. broad, the outer surface of the outer ones buff, with three unbranched, purple lines. March. *l.* four or five, appearing with the flowers, 8in. to 9in. long, ⅛in. broad, the lateral channels wide and open; sheathing ones three or four, ½in. to 2½in. long. Corm oblate, ⅜in. broad, ½in. high. Rome, 1830. (B. M. 3864; M. C. 15; S. B. F. G. ser. ii. 7.)

C. susianus fulvus (fulvous). *fl.*, outer surface of the outer perianth segments suffused dull brown.

C. Suterianus (Henry Suter's). *fl.*, perianth tube 3in. long; throat unbearded; segments bright orange, fulvous towards the throat, 1in. to 1½in. long, ½in. broad. January to March. *l.* about three, appearing with the flowers, 10in. long, $\frac{1}{16}$in. broad, the surface of the keel and margins of the blade ciliated, the lateral channels wide and open; sheathing ones about four, ½in. to 3in. long, enclosing three or four scapes. Corm pyriform, ½in. to ⅝in. broad and high. Central Asia Minor. (M. C. 52.) Syn. *C. chrysanthus* (of Herbert in B. R. xxxiii. 4, f. 1).

C. Suwarrowianus (Suwarrow's). A variety of *C. vallicola.*

C. syriacus (Syrian). A form of *C. vitellinus.*

C. Tommasinianus (Tommasini's). *fl.*, perianth tube 3in. to 3½in. long; throat white, unbearded; segments pale sapphire-

Crocus—*continued.*

lavender (said, by Herbert, to be occasionally marked with a darker blotch near the summit), 1in. to 1½in. long, ½in. to ⅝in. broad. March. *l.* three to five, appearing with the flowers, 9in. to 10in. long, ⅛in. broad, glabrous, the lateral channels wide and open; sheathing ones about four, ½in. to 3in. long. Corm nearly spherical, barely ½in. in diameter. Dalmatia, &c. (M. C. 25.)

C. vallicola (valley-loving). *fl.*, perianth tube buff, about 3½in. long; throat bearded; segments pale cream-colour, veined internally with five to seven purple lines, and bearing two small, orange spots towards the throat, lanceolate, 1⅝in. to 2½in. long, terminating in a fine, thread-like point; proper spathe monophyllous. August and September. *l.* four or five, 10in. to 11in. long, ⅛in. broad, glabrous, with an obscure, central, white band the lateral channels deep; sheathing ones four to six, about 1½in. long, falling short of the proper spathe. Corm oblate, ½in. to ⅝in. broad, ⅝in. high. Caucasus, &c. (B. R. xxxiii. 16, f. 3; M. C. 2, f. 1, 4, 7, 9, 13.)

C. v. lilacinus (lilac). *fl.* much smaller than in the type; perianth segments veined with feathered, purple markings, both internally and externally. (M. C. 2, f. 6, 10, 11.)

C. v. Suwarrowianus (Suwarrow's). *fl.*, perianth throat unbearded; proper spathe diphyllous. *l.*, sheathing ones exceeding the proper spathe. September and October. (M. C. 2, f. 2, 3, 5, 8, 12, 15.)

C. veluchensis (Veluchi). A garden synonym of *C. banaticus.*

C. vernus albiflorus (white-flowered). *fl.* white, smaller than those of the type; perianth segments narrower. (M. C. 26 B, f. 6.)

C. v. leucorhynchus (white-beaked). *fl.*, perianth segments pale purple, with a deep purple flush near the white, emarginate apex. (M. C. 26 B, f. 4.)

C. v. siculus (Sicilian). *fl.* small; perianth segments whitish, with three or four purple lines on the face of each, rounded at apex. (M. C. 26 B, f. 9.)

C. vitellinus (egg-yolk-coloured). *fl.*, perianth tube pale yellow, filiform, 2in. to 3in. long; limb orange-yellow, about 1in. long, "its oblong-spathulate segments concolourous in the original *vitellinus*, striped with five feathered lines in the variety *syriacus*, and in a third form plain orange, with an obscurely lineate, brownish blotch at the base" (J. G. Baker); style much divided. November to March. *l.* five or six, glabrous, with a white, central band. Syria and Asia Minor. (B. M. 6416; M. C. 50.)

C. Weldeni (Welden's). A form of *C. biflorus.*

C. zonatus (zoned). *fl.*, perianth tube pale buff, 2½in. to 3in. long; throat bright yellow, bearded; segments rosy-lilac, about 1½in. long, six to seven lines broad, veined internally with five to seven purple lines, and bearing on the inner surface of their base two semicircular, bright orange spots. September and October. *l.* 1ft. long, ⅛in. to $\frac{1}{16}$in. broad, with a depressed, central, white band, the lateral channels wide and open; sheathing ones five to seven, ½in. to 3in. long. Corm oblate, 1in. to 1½in. broad, ½in. to ⅝in. high. Cilician Mountains and Lebanon. (M. C. 4.)

Varieties. The varieties of *C. vernus* are amongst the brightest flowers for the spring garden, and are excellent when planted in pots to be forced for the greenhouse or conservatory. Many beautiful varieties grown in the bulb gardens near Haarlem are but little known in British gardens. To those described on p. 400, Vol. I., the following should now be added:

Avalanche, pure white; Baron Brunow, dark blue; Bride of Abydos, pure white, large; Celestial, light blue, distinct; Dorothea, white; Gladiator, dark blue; Grand Blanche, pure white, large; Grand Conquérant, white; John Bright, dark blue; King of the Blues, purple-blue, large, good form; La Majesteuse, striped lilac, large; Marie Stuart, fine white; Purpurea grandiflora, deep purple, large and handsome, the finest of all Crocuses; Vulcan, fine dark purple.

CRYPTANTHUS. Baker reduces to one species, native of Brazil, the various garden plants described under this name. To the two forms described on p. 402, Vol. I., the following should now be added:

C. Beuckeri (Beucker's). *fl.* white, in a sessile, central cluster. *l.* disposed in an open rosette, petiolate, elliptic, acute or acuminate, light reddish, with numerous transverse, green, irregular lines or blotches, the margins spinulose. 1883. A remarkable, dwarf Bromeliad. (B. H. 1881, 17.)

CRYPTOMERIA. To the varieties of *C. japonica* described on p. 404, Vol. I., the following should now be added:

C. japonica compacta (compact). This forms a compact, regular pyramid. Japan, 1885.

C. j. lycopodioides (Lycopod-like). Habit thick and bushy, very regularly branched, the branchlets long and cord-like. Japan, 1885.

CRYPTOPHORANTHUS (from *kryptos*, hidden, *phoreo*, to bear, and *anthos*, a blossom; in allusion to the petals, lip, &c., being concealed within an almost closed flower, the only opening into which is by a pair of small "windows" at the side). Window-bearing Orchid. ORD. *Orchideæ*. A curious genus, with the habit of *Pleurothallis* (section *Aggregatæ*), but differing from that genus in the sepals being united into a short tube at the base and again united at the apex—the only way into the flower being by the small, window-like openings, one on either side. From *Masdevallia* the genus differs in habit, as also in the characters just given. Eight species are known; they are stove Orchids, ranging over an area from the West Indies to the Andes and Brazil. The following species are now included here, the specific names remaining unchanged: *Masdevallia Dayana*, *M. gracilenta*, *M. hypodiscus*, and *Pleurothallis atropurpurea*. For culture, *see* **Pleurothallis,** on p. 163, Vol. III.

C. maculatus (spotted). *fl.* yellow, densely spotted crimson, numerous, ⅛in. long, obovoid, obtuse, pubescent, situated at the base of the leaf on the very short stem (so short that the flowers actually lie on the soil). *l.* elliptic, obtuse, very fleshy, with numerous purple spots or small blotches on the upper surface, 1¼in. to 2¼in. long, ¾in. to 1¼in. broad, the apex minutely tridenticulate. Probably Brazilian. A remarkable little plant.

CRYPTOSTYLIS (from *kryptos*, hidden, and *stylos*, a pillar, a style; in allusion to the concealed style). The generic description is given in the body of this work under Blume's name, **Zosterostylis** (which *see*, on p. 244).

C. longifolia (long-leaved). *fl.* three to eight, rather distant, upwards of 1in. broad; sepals yellowish-green, narrow; petals the same colour, shorter; lip red, with reddish-brown markings, pointing upwards, the short style hidden in the cucullate base (hence the generic name). *l.* solitary, lanceolate, on long stalks. *h.* 1ft. to 2ft. Tasmania, 1885. Greenhouse. (G. C. n. s., xxiii., p. 275.)

CUPANIA. To the species described on p. 409, Vol. I., the following should now be added:

C. grandidens (large-toothed). *l.* impari-pinnate; leaflets nine, oblong, acuminate, sinuately lobed, 3in. to 4in. long. Stems downy. Zanzibar, 1884.

CURCULIGO. This genus comprises about a dozen species of stove perennials, natives of tropical Asia, Australia, tropical and South Africa, and tropical America. Flowers spicate or racemose; perianth six-parted, the segments sub-equal, spreading; stamens six, affixed at the base of the segments; whole inflorescence frequently villous. Fruit more or less succulent. Leaves radical, often long-lanceolate, plicate-veined, sometimes very large. To the species and varieties described on p. 410, Vol. I., the following should now be added:

C. densa (dense). *l.* oblong-ovate, acute, plicate, dark green, with a silvery lustre. India, 1885. A pretty, decorative plant, of dwarf habit.

CURCUMA. The species extend from tropical America to tropical Australia and the South Pacific Islands. To those described on p. 411, Vol. I., the following should now be added:

C. Leopoldi (Leopold's). *l.* lanceolate, pale green, striped with creamy-white. 1884. An attractive plant, of distinct character, growing in clumps, and resembling a Musa in habit.

CYATHEA. This genus embraces about eighty species, natives of tropical and sub-tropical regions. To those described on p. 415, Vol. I., the following should now be added:

C. microphylla (small-leaved). *cau.* 4ft. high. *sti.* and rachises rusty-tomentose. *fronds* 2ft. to 3ft. long, oblong-ovate, acuminate, tripinnate; primary pinnæ sessile, broadly oblong, acuminate; secondary ones similar but smaller, crowded; pinnules scarcely two lines long, ovate-oblong, deeply pinnatifid; lobes entire. *sori* solitary at the base of the veinlet; involucre globose. Andes of Peru and Ecuador, 1883. Greenhouse.

C. spinulosa (slightly spiny). *sti.* and main rachis strongly aculeate, often dark purple. *fronds* glabrous, ample, somewhat flaccid; pinnules oblong, acuminate; lobes acute, serrulated, having small, bullate scales on the costules beneath. *sori* copious, close to the costules; involucre globose, very thin, membranous, soon breaking irregularly. India, 1883. Stove. (H. S. F. 12c.)

CYCAS. About fifteen species, natives of tropical Asia, Africa, Australia, and Polynesia, are here included. To those described on p. 416, Vol. I., the following should now be added:

C. Beddomei (Beddome's). *l.* about 3ft. long and 9in. broad; segments about ½in. broad; rachis sub-quadrangular; petiole quadrangular, furnished at the base with tufted tomentum, and in the upper third with a few minute teeth. *cones* (males) about 15in. long and 3in. in diameter, slightly stipitate, the scales tapering from a deltoid base, acuminate. Stem (? young) a few inches high, with closely imbricated, glabrescent leaf-bases. India, 1883. Mr. Thiselton Dyer considers this a reduced form of *C. circinalis*. (T. L. S., ser. ii., vol. ii., p. 85.)

C. Bellefonti (Marquis de Bellefont's). *l.* recurved, glabrous, elliptic, pinnatisect; leaflets sessile, linear-lanceolate, 3½in. to 4in. long, acuminate at apex, the margins flat, glaucescent; petioles short, spinulose at base, the spines small, straight. Trunk short, cylindrical, erect, clothed with fuscous-greyish scales. Tonkin, 1886. (I. H. 1886, 586.)

C. Duivenbodei (Duivenbode's). *l.* pinnate, 3ft. to 3½ft. long; leaflets crowded, acuminate, 1in. broad. Trunk spiny, covered with blackish-brown scales. Moluccas, 1886.

CYCLAMEN. Improved seedling forms of *C. persicum* are now very numerous, and the cultivation of this choice, winter-flowering, greenhouse plant is being greatly extended. The flowers become richer and more varied in colour year by year. *C. giganteum*, a type with large flowers, produced some ten years since, has been greatly improved; the flowers are blush, rosy-blush, or purplish-rose. The most useful for greenhouse and conservatory decoration is a good strain of the ordinary type. The largest number of flowers are produced from single corms, and the colours are more rich and varied. They are pure white, of exquisite form, blush, rose, pink, rosy-red, and purple; and a form exhibited in 1887 was quite crimson. A new type, with peculiarly frilled petals, was introduced in the spring of that year. Some of the best in the various sections exhibited under names are as follow: DIXON HARTLAND, LORD HILLINGDON, MAJESTICUM, PRINCESS OF WALES, QUEEN OF CRIMSONS, and ROYAL JUBILEE.

CYCLANTHACEÆ. A natural order of perennial herbs or shrubs, all natives of tropical America. Flowers monœcious, arranged in superposed cycles or in a continuous spiral; spadices axillary, solitary, pedunculate, simple, rather short, cylindrical or oblong; spathes two to six, inserted on the peduncle, including the immature spadix, caducous; peduncle short or elongated, sheathing at base. Leaves distichous or spirally disposed, petiolate, flabellate, entire, bifid, or bipartite, parallel-nerved, complicate in vernation; petioles short or elongated, sheathing at base. *Carludovica palmata* yields the much-valued straw from which are manufactured Guayaquil or Panama hats. The order embraces four genera—*Carludovica*, *Cyclanthus*, *Ludovia*, and *Stelestylis*—and, as at present known, about thirty-five species.

CYCLANTHUS (from *kyklos*, a circle, and *anthos*, a flower; in allusion to the spiral arrangement of the flowers). SYNS. *Cyclosanthes*, *Discanthus*. ORD. *Cyclanthaceæ*. A small genus (four or five species?) of stove, perennial, stemless, milky herbs. Flowers odorous, the males and females superposed in alternate rings, or disposed in a confluent spiral; spathes numerous; peduncle very long, naked or bracteate, cylindrical. Leaves clustered, long-petiolate, bifurcate; segments lanceolate, one-ribbed, plicate, parallel-nerved; petioles terete, sheathing at base. For culture of the two species introduced, *see* **Carludovica,** on p. 268, Vol. I.

C. bipartitus (bipartite). *l.* plicate, sometimes entire, ovate-lanceolate, but more frequently divided more or less deeply in the upper portion—sometimes even to the base—into two lanceolate-linear lobes; petioles 3ft. to 6ft. long. Guiana.

C. discolor (two-coloured). *l.* bifid, the two divisions lanceolate, with a tapered point, more or less frilled at the edges; young leaves streaked with a tawny orange hue, which passes off as they become matured. 1882. A remarkable plant.

CYCLONEMA MACROSIPHON. *See* **Clerodendron macrosiphon.**

CYCLOSANTHES. A synonym of **Cyclanthus** (which *see*).

CYMBIDIUM. To the species and varieties described on pp. 420-1, Vol. I., the following should now be added:

C. eburneum Philbrickianum (Philbrick's). *fl.* white; sepals and petals narrow; side lobes of the lip well apart from the narrower middle lobe; callus narrow, with a most obscure mid-keel. 1886. Habit that of *C. Parishii.*

C. elegans (elegant). A synonym of *Cyperorchis elegans.*

C. ensifolium (sword-leaved). *fl.* greenish-yellow, very fragrant; sepals and petals marked with some reddish-brown, narrow lines; lip dotted, ovate, somewhat recurved; scape terete, few-flowered. Late summer. *l.* ensiform, nerved. China and Japan. (B. M. 1751.)

C. e. estriatum (not striated). *fl.*, segments very narrow; sepals green, with a few red lines; petals white, with some purple lines; lip white, the middle lacinia yellow, with a few brown spots; column white, with purple blotches in front. *l.* more than 1ft. long, ¼in. broad, with dark spots. Assam, 1837.

C. Huttoni (Hutton's). This is now regarded as synonymous with *Grammangis Huttoni.*

C. Mastersii (Dr. Masters'). This species is now removed to *Cyperorchis.*

CYNORCHIS (from *kyon, kynos,* a dog, and *Orchis;* a name altered by Lindley from the *Cynosorchis* of Thouars). Syn. *Cynosorchis.* Ord. *Orchideæ.* A genus embracing about sixteen species of stove, terrestrial Orchids, with the habit of *Habenaria rotundifolia,* natives of the Mascarene Islands and tropical Africa. Flowers mediocre or rather small, shortly pedicellate; sepals sub-equal, concave, at length spreading; petals similar or smaller; lip continuous with the column, spreading, as long as the sepals, three to five-cleft, produced in a spur; column very short; raceme short or rarely elongated, rather loose. Only two species call for description. For culture, *see* **Bletia,** on pp. 195-6, Vol. I.

C. elegans (elegant). *fl.* whitish, with a rosy tinge, disposed in three to seven-flowered racemes; odd sepal gibbous, convex, abrupt over the triangular, acute apex; side sepals ligulate, acute or blunt-acute, longer than the odd sepal; lip with a small angle on each side at the base, the lamina spotted or lined deep purple. *l.* cuneate-oblong-lanceolate, acute, 2in. long by ½in. wide, light green, striped and barred mauve-purple. Madagascar.

C. Lowiana (Low's). *fl.*, sepals and petals whitish-green; lateral sepals oblong, obtuse; odd sepal convex-oblong, blunt-acute, shorter than the lateral ones; petals ligulate, acute; lip lilac, three-cleft, the lateral laciniæ linear, extrorse, the mid-lacinia deeply two-cleft, with a deep purple, obcordate spot at base. *l.* one or two, about 9in. long, ¾in. wide, dark green. Madagascar.

CYNOSORCHIS. A synonym of **Cynorchis** (which *see*).

CYPERORCHIS (from *Cyperus* and *Orchis;* in allusion to the resemblance to *Cyperus,* and the affinity to *Orchis*). Ord. *Orchideæ.* A small genus (two or three species) of stove, epiphytal Orchids, natives of the East Indies and the Malayan Archipelago, formerly included under *Cymbidium.* Flowers showy; sepals and petals sub-equal, free, erect or somewhat spreading; lip sessile at the base of the column, erect, narrow, concave, the lateral lobes embracing the column, the middle one short, broad, spreading; column rather long, erect, semi-terete; pollen masses two; raceme many-flowered; scape erect. Leaves long, narrow, scarcely dilated at base. Stem short, leafy, hardened or slightly thickened at base. For culture, *see* **Cymbidium,** on p. 420, Vol. I.

C. elegans (elegant). *fl.* pale yellow, remaining half-closed, cylindrical; lip spotted blood-red inside; racemes nodding, many-flowered. Autumn. Nepaul, 1840. Syn. *Cymbidium elegans* (L. S. O. 14).

C. Mastersii (Dr. Masters'). The correct name of the plant described on p. 421, Vol. I., as *Cymbidium Mastersii.* (B. R. 1845, 50.)

C. M. album (white). *fl.* pure white, deliciously fragrant. Winter. India.

CYPRIPEDIUM. This genus embraces about sixty species, natives of Europe, temperate and tropical Asia, North America, and Mexico. To those described on

Cypripedium—*continued.*

pp. 423-7, Vol. I., the following should now be added. Except where otherwise indicated, they require stove treatment.

C. almum (pure). *fl.*, dorsal sepal white, with broad, radiating, purple nerves, and some short, green ones, the lateral ones connate in a partially purple body; petals brown and green, with blackish calli; lip very dark, as in *C. barbatum* (between which and *C. Lawrenceanum* this is supposed to be a hybrid). 1887.

C. amandum (lovely). *fl.* green, spotted sepia-black, white at top and on the outside margins, oblong, acute, the lower ones green; petals ochre in the middle, brick-red at the sides, descendent, ligulate; lip light yellow, brown around the mouth, rather slender, with curved horns at each side of the mouth. *l.* strap-shaped, 1½ft. long, 1½in. wide, sharply keeled at back, dark green, with blackish-mauve freckles at the base of the posterior side. 1887. A hybrid between *C. insigne* and *C. venustum.*

C. Amesianum (F. L. Ames'). *fl.*, dorsal sepal white, veined and netted green, stained soft brown towards the base, ovate; petals as in *C. villosum,* the upper half chestnut-brown, the lower much paler; lip brown, tinged green and flesh-colour in front, large, resembling that of *C. villosum. l.* 7in. to 9in. long, 1½in. broad, slightly spotted purple beneath. 1887. A hybrid between *C. villosum* and *C. venustum.* (W. O. A. 340.)

C. apiculatum (apiculate). *fl.* shining inside; dorsal sepal reddish-brown, veined blackish-purple, margined ochreous, the lower ones green, veined reddish-brown; petals brownish-purple, the lower half yellowish and spotted purplish-black; lip greenish-ochre, spotted brown, resembling that of *C. Boxallii* in form. 1886. A garden hybrid between *C. barbatum* and *C. Boxallii.*

C. Arthurianum (Arthur's). *fl.*, dorsal sepal pale green, tipped with white, and ornamented with clear, dark pencillings. 1882. A fine hybrid between *C. insigne* and *C. Fairieanum.* (L. iii. 121.)

C. Ashburtoniæ expansum (expanded). *fl.*, upper sepal broad, having a large, ivory-white, crescent-like zone from the top along the margin to the middle, where it has numerous brownish-black nerves covered with distant, dark blotches on a green ground-colour; petals (and leaves) broader than in the type. 1885.

C. barbatum Warnerianum (Warner's). *fl.*, dorsal sepal white, striped green towards the base, with a transverse band of vinous purple, large; petals green-striped above, white towards the base, the rest purple, tipped white; lip deep brownish-purple. March to May. *l.* distinctly tessellated. India. (W. S. O. iii. 11.)

C. Barteti (Bartet's). *fl.*, dorsal sepal green, flushed rose, nerved blackish-purple, and bordered white, broad; petals yellowish, striped reddish-brown, conspicuously veined, shining, narrow. 1886. This hybrid is much like *C. Laforcadei,* having been raised from the same capsule, but it is the better of the two.

C. bellatulum (rather pretty). *fl.* white or whitish-yellow, spotted all over, and as much as 11in. in circumference; staminode very long, oblong, tridentate at apex, beautifully spotted, almost free from hairs. *l.* 10in. long, 3in. wide, beautifully marbled with light, hieroglyphic spots on the upper surface, the lower one being covered with innumerable brown dots. 1888.

C. Berggrenianum (Berggren's). *fl.*, sepals light purple, with darker nerves, and with a few Indian-purple spots at base, the lower one lightest green; petals dark purple, the base yellowish, with dark green spots; lip resembling that of *C. Dauthieri;* peduncle dark purple. *l.* ligulate, acute, light green, sparsely tessellated above. This plant is supposed to be a hybrid between *C. Dauthieri* and *C. insigne.*

C. Boxallii atrata (dark). *fl.*, dorsal sepal green, speckled blackish-brown; lip and lateral petals reddish-purple irregularly mixed with light green, the upper margin white. 1887. (G. C. ser. iii., vol. i., p. 210.)

C. caligare (shoe-like). *fl.*, median sepal whitish, nerved green; lateral sepals narrow, whitish; petals ligulate, acute, ciliate, the under side white, veined green, and the upper side purplish-mauve, with white base; lip cinnamon-brown, the mouth bordered ochre; peduncle reddish-green, with very short hairs. *l.* resembling those of *C. venustum* (which is one of the parents of this hybrid, *C. Dayanum* being the other).

C. callosum (hard). *fl.* very large, remaining some weeks in perfection; dorsal sepal pure white, striped with dark chocolate-crimson, 2½in. across; petals and pouch soft rose or crimson on a greenish-white ground. Cochin China, 1887. Greenhouse. In growth this plant resembles a strong *C. barbatum.* (G. C. ser. iii., vol. i., p. 315; R. H. 1888, 252.)

C. calophyllum (beautiful-leaved). *fl.*, dorsal sepal as in *C. barbatum,* but greener-nerved; petals and lip as in *C. venustum,* but the lip is browner than in that species. *l.* darkly tessellated. A garden hybrid between the species named.

Cypripedium—*continued.*

C. Chantinii (Chantin's). A synonym of *C. insigne punctatum violaceum.*

C. chloroneurum (greenish-nerved). *fl.* large; dorsal sepal lively pale green, with darker reticulations, bordered white; petals green, suffused on the upper half with purple, and with a few black warts near the base, oblong; lip heavily stained wine-purple, with darker reticulations, large. January and February. *l.* variegated. Hybrid. (W. O. A. i. 37.)

C. chlorops (green-eyed). *fl.*, upper sepal narrow, triangular, shining, undulate at the margin, nerved dark green; inferior sepal broader, a little shorter than, or almost equal to, the lip, nerved red on the outside; petals broader at the base, extended into a long, brown, nearly glabrous tail; lip very broad; peduncle 1½ft. long, bearing seven or more flowers. *l.* rather narrow. 1887. A garden hybrid, of which the parents are unknown.

C. ciliolare (ciliolated). This much resembles *C. superbiens*, of which it is probably only a slight form; sepals and petals having more numerous nerves and more hairy margins; nail of the lip shorter, and the staminode lower and broader. Philippines, 1883.

C. concinnum (neat). *fl.* large; dorsal sepal suffused bright rosy-purple, margined white; petals ligulate, deflexed, the upper half bronzy-crimson; lip reddish-purple, large. 1887. A hybrid between *C. Harrisianum* and *C. purpuratum.*

C. concolor chlorophyllum (green-leaved). *fl.* covered with small spots. *l.* free from marbling. 1886.

C. c. Reynieri (Reynier's). *fl.* yellow, with a purple blotch on the outside of the sepals, the staminode ochre, clotted with purple, and having a white margin in front. *l.* large, well marbled. 1886.

C. c. tonkinense (Tonkin). *fl.* larger than in the type. Tonkin, 1887. (L. ii. 77.) SYN. *C. tonkinense.*

C. conspicuum (conspicuous). *fl.*, upper sepal light green, bordered white, and nerved black, broad-elliptic, acute; inferior connate sepal very light green, narrower, oblong, acute; petals ligulate, broader towards the top, blunt-acute, ciliated on upper margin, the superior half almost black at base, then chestnut, shading to reddish-ochre at the top, the inferior half light brown at base, with dark spots, verging to reddish-ochre at top; lip larger than that of *C. villosum*, brown in front, ochre-coloured beneath. *l.* ligulate, acute, over 1in. broad in the middle, the upper surface deep green, with darker markings, the lower surface lighter, dotted at base with small, dark brownish spots. Hybrid, of doubtful origin.

C. c. pictum (painted). In this variety the upper sepal has a purple wash on both sides, and the inferior base of the petals is light green.

C. Crossianum (Cross'). *fl.*, dorsal sepal white, with green lines and numerous blackish dots near the base, broadly ovate; petals coppery-brown, ligulate, the basilar half dotted blackish; lip brownish-yellow, veined greenish; scape purplish, hairy. *l.* oblong, glaucous, blotched dark green. A hybrid between *C. insigne* and *C. venustum.*

C. Curtisii (Curtis'). This is much like *C. ciliolare*; the petals are narrower, with shorter ciliæ and smaller spots, which latter are numerous at the tops of the petals; lip large, with acute side angles. Sumatra (?), 1883. (W. O. A. 122.)

C. Dauthieri (Dauthier's). *fl.* large; dorsal sepal rosy, striped with reddish-brown, and bordered with white, broadly elliptic; lower sepals yellowish-white, with dark green nerves. *l.* broad, clear yellowish-green, reticulated with dark green. 1885. A handsome plant.

C. D. Rossianum (Ross's). A garden hybrid in which "there is no purple between the purple-lilac, which contrasts neatly with the white ground. The odd sepal has broken lines of black-purple spots outside in lieu of green lines. The petals have ochre-brown lines, and the greater part of the lip is ochre-brown, not Indian purple-brown" (Reichenbach).

C. delicatulum (rather delicate). *fl.*, upper sepal broad, elliptic, veined green, washed purple, the lateral ones nerved green, forming a ligulate, acute body; petals brownish-purple on the anterior half, nerved green, deflexed, ligulate, dilated, acute, densely ciliated, with a dark purple, median nerve on the upper part. 1887. Hybrid.

C. dilectum (beloved). *fl.*, lateral sepals light green, with dark lines and spots at base, very narrow, connate; median sepal narrow-oblong, obtuse, margined white at top; petals cuneate, oblong-obovate, obtuse, with a black line running down the middle, the inferior part green, the superior portion purplish-mauve, shading to light green near the black line, the base light green, spotted black; lip slender, the central portion two-horned, with a retuse median border, yellowish-green outside, spotted blackish-purple inside. The origin of this plant is very doubtful.

C. doliare (cask-like). *fl.*, petals green at base, brownish-purple in front, with numerous small dots at the base, ciliated on the borders; lip cinnamon-brown, shining, suggesting the idea of a cask; staminode dark brown, with a lighter border. 1887. Hybrid.

C. Electra. *fl.*, upper sepal green, spotted dark brown and bordered white; petals veined and netted purplish-brown, with a few dark spots near the base; lip purplish-brown. *l.* pale glaucous-green, with darker reticulations. A hybrid, of doubtful origin.

C. Galatea. *fl.* much like those of *C. insigne*, but the upper sepal is almost primrose-coloured, most densely spotted, and white-margined almost to the base; petals purplish-brown in the upper half, paler below, blotched purplish-brown, finely ciliated; lip paler, very indistinctly veined. 1888. Hybrid, of unknown origin.

C. Germinyanum (Comte de Germiny's). *fl.*, dorsal sepal green, with a shining brown disk; petals green, spotted brown at base, ligulate-oblong, spreading, the broader front part purple; lip greenish-yellow, brown in front. 1886. A garden hybrid between *C. villosum* and *C. hirsutissimum.*

C. Godefroyæ (Mme. Godefroy-Lebœuf's). *fl.* covered with fine, white hairs; sepals and petals white or nearly so, thickly spotted chocolate; lip spotted chocolate inside the pouch, outside with brighter spots; peduncle robust, rising above the foliage. *l.* ligulate-oblong, 4in. to 8in. long, 1in. to 1½in. broad, sometimes dark green, spotted white, sometimes spotless, the under surface spotted blood-red. 1884. Siam. (B. M. 6876; G. C. n. s., xxiii. 49; R. G. 1887, p. 86; W. O. A. 177.)

C. G. hemixanthina (half-yellow). A variety having sulphur-yellowish-white sepals. 1885.

C. Godseffianum (Godseff's). *fl.*, lateral sepals light yellow, with a few dark spots at base, oblong, acute; median sepal very light yellow, oblong, the disk sepia-brown, marked yellow; petals ligulate, spreading, purplish-mauve, sulphur, and brown, dotted blackish-red; lip light brown above, the under surface yellow, slender, blunt; peduncle reddish-hairy. *l.* about 9in. long and 2in. broad, stiff. A hybrid, raised from *C. hirsutissimum* and *C. Boxallii.*

C. hephæstus (fiery). *fl.* as large as those of *C. barbatum*; dorsal sepal white, veined green and purple; lower sepal white, veined green; petals slightly depressed, the basal half brownish-green, with a few blackish dots, the other half dull purple; lip resembling in colour that of *C. barbatum nigrum*, but not so bright, the infolded lobes being dull vinous-purple. *l.* similar to those of *C. Lawrenceanum*, but with less bright tessellation. Hybrid, of doubtful origin.

C. Hornianum (Horn's). *fl.*, upper sepal white, with dark purple markings, yellowish-green at base; petals light-greenish, very pale purple on the margins; lip purplish-brown, much as in *C. Spicerianum*; peduncle ochre, with reddish-purple stripes, hairy. *l.* marked with pale, transverse, interrupted bars. 1887. A hybrid between *C. superbiens* and *C. Spicerianum.*

C. Hyeanum (Hye's). A form of *C. Lawrenceanum.*

C. insigne albo-marginatum (white-margined). *fl.*, dorsal sepal yellowish-green, broadly margined white, spotted brown on the green part; petals tawny-yellow, with darker veins; lip pale brownish, yellow inside. India, 1886. A distinct variety. (W. O. A. 232.)

C. i. aureum (golden). This variety is remarkable for the golden glow which pervades the flowers, the colouring of which is in other respects of the normal character. 1882.

C. i. Mooreanum (Moore's). *fl.* 5in. in diameter; dorsal sepal greenish-yellow, striped green, broadly margined white, with very large, dull purple spots; petals pale yellowish-green, flushed rosy-crimson, blotched at base; lip bright bronze; spikes 18in. to 20in. long. *l.* 14in. long. 1887.

C. Io (Io, whose guard was Argus). *fl.* resembling those of *C. Argus*; dorsal sepal broad, the median nerves green, the side ones purple, the lower sepals broad, green-nerved; petals brownish at the tips. *l.* as in *C. Lawrenceanum.* 1886. A garden hybrid between *C. Argus* and *C. Lawrenceanum.*

C. Laforcadei (Laforcade's). *fl.*, dorsal sepal white, with purplish nerves; petals shaded with rose on a dark green ground, ciliated on the margins; lip dark red or slightly purplish, shining. 1885. A hybrid between *C. insigne punctatum violaceum* and *C. barbatum*, which latter it resembles in habit and foliage.

C. Lathamianum (Latham's). *fl.*, dorsal sepal greenish, cuneate-oblong, minutely acute, shorter than the lip; median sepal white, green at base, with a purple median line, cuneate-elliptic, apiculate; petals light greenish-ochre outside, with a dark median line and brown margins, on the inside superior part light ochre at base, then dark brown to the top, greenish at apex and lower sides; lip light greenish-ochre; peduncle ochreous, short-hairy. *l.* similar to those of *C. Spicerianum* (which is one of the parents of this hybrid, *C. villosum* being the other).

C. Lawrenceanum coloratum (coloured). *fl.*, median sepal not retuse, but markedly acute, the dark nerves having the interstices tinted with light mauve; warts on the petals numerous and strong. 1887.

Cypripedium—*continued.*

C. L. Hyeanum (Hye's). *fl.*, dorsal sepal white, veined green, large; petals ciliated; lip entirely green. Borneo, 1886. SYN. *C. Hyeanum.*

C. L. pleioleucum (whiter). A variety in which the superior area of the upper sepal is white, and the remarkably scarce coloured radii are very short, the flower thus having a distinct appearance.

C. L. stenosemium (narrow-standard). *fl.*, upper sepal narrower than in the type, nearly elliptic in outline. 1887.

C. Leeanum (W. Lee's). *fl.*, dorsal sepal pure white, with a central dotted bar of bright purplish-red, broadly oval, the base emerald-green, with mauve spots passing into the white; petals striped longitudinally with reddish-brown; pouch shining brownish-red; scape rather long. *l.* bright green, ligulate. 1884. A charming, dwarf and compact hybrid between *C. insigne Maulei* and *C. Spicerianum.* (L. iii. 125; W. O. A. v. 223.)

C. L. superbum (superb). A fine variety, the large and showy dorsal sepal marked with radiating rows of purple lines, green and shining at the base. 1886.

C. Lemoinierianum (Lemoinier's). *fl.*, sepals whitish-yellow, nerved purple, the lateral edge of the upper one inflexed, purple; petals white on the disk inside, with a purple margin and top, descending, but ascending at apex, lanceolate, acuminate, with a broad base; lip very broad, inflexed, retuse-ventricose, the side lobes yellowish-white, spotted purple inside, inside white, spotted purple, the sac and inferior side fine dark purple; bracts light green, very large, spathaceous, equal to or surpassing the reddish-purple ovary; peduncle very strong, about 3ft. high, and as thick as an eagle's quill, brownish-purple, hairy, usually branched. *l.* long, from 2in. to 3in. wide, sharply keeled on the under side. 1883. Garden hybrid.

C. lineolare (slightly lined). *fl.*, sepals white, with green nerves; petals light ochre, with light mauve nerves; lip light ochre and light brown. *l.* having numerous sharp, dark, transverse designs. 1887. Hybrid.

C. macropterum (long-winged). *fl.*, sepals light green, the upper one nerved with brown inside at the base; petals very long, much dilated, oblong from a cuneate, semi-sagittate base, which is ochreous, with blackish-purple spots, the front part purple, the upper margins hairy; lip like that of *C. Lowii*, but longer. 1883. A fine garden hybrid between *C. Lowii* and *C. superbiens*, with the inflorescence of the former, and the short leaves of the latter.

C. marmoratum (marbled). *fl.* curiously striped and marked like a flake Carnation, the flaking being a pretty combination of white, purple, and rose, very handsome. 1887. (G. C. ser. iii., vol. i., p. 576.)

C. marmorophyllum (marbled-leaved). *fl.*, upper sepal shaped as in *C. barbatum*, the margin washed purple and the centre green, the nerves green; petals bent down as in *C. Hookeræ*, but more purple, bordered with bristles, with two warts on each superior limb; lip having the side angles a little more developed than in *C. Hookeræ*, the inflexed margins covered with warts; scape purple, tall. *l.* as in *C. Hookeræ.* A hybrid between the species named.

C. Marshallianum (Marshall's). *fl.* pale rose-coloured, the sepals and petals thickly sprinkled with small purple spots, which gradually arrange in lines on the dorsal sepal and disappear at the apex; lip with very few spots, and those minute. 1887. (G. C. ser. iii., vol. i., p. 513.)

C. Measuresianum (R. H. Measures'). *fl.*, dorsal sepal yellow, margined white, veined yellowish-green; petals shaped as in *C. villosum*, light brownish-purple, changing to bright orange, the upper half suffused purple; lip orange, tinted and veined purplish-brown. large; scapes purple, hairy. *l.* 5in. to 8in long, 1in. to 1½in. broad, marked purple below. 1887. A hybrid between *C. villosum* and *C. venustum.* (W. O. A. 304.)

C. Meirax (youthful). *fl.* medium-sized; dorsal sepal blush-white, nerved green and purple, broadly ovate, ciliated at base; petals purplish-crimson, nerved green, linear-oblong, ciliated; lip glossy yellowish-green in front, veined and barred crimson-purple, the point margined deep purple; scape dark purple, hairy. Winter and spring. *l.* oblong-lanceolate, acute, faintly mottled above, wine-purple beneath. A small-growing hybrid. (W. O. A. 95.)

C. melanophthalmum (dark-eyed). *fl.* medium-sized; dorsal sepal whitish, flushed purple towards the base, nerved green; petals glossy, linear-oblong, acute, the upper half purple, nerved green, the lower half paler, with wart-like spots on the base and the ciliated margins; scapes purplish-downy. Winter and spring. *l.* pale green, with darker, coarse reticulations. Hybrid. (W. O. A. iii. 109.)

C. microchilum (small-lipped). *fl.* broader than in *C. niveum;* upper sepal white, with a central, spotted bar, and several other faint lines and dark cinnamon stripes, roundish, apiculate; petals white, with a crimson, central stripe and several lines of small spots, broadly roundish-oblong; lip white, veined pale green, very small, laterally compressed *l* ligulate, recurving, finely tessellated. 1884. A hybrid between *C. niveum* and *C. Druryi.* (L. 50.)

Cypripedium—*continued.*

C. montanum (mountain-loving). *fl.* brownish-purple, with a white lip, striped with red inside; column yellow, spotted with crimson. *l.* lanceolate, pubescent. *h.* about 1ft. Oregon, 1883. A beautiful little, hardy Orchid.

C. Morganæ (Mrs. Morgan's). A synonym of *C. Morganianum.*

C. Morganianum (Morgan's). *fl.*, dorsal sepal tinted rose, elliptic, apiculate; petals whitish-sulphur, with numerous brownish-mauve blotches and stripes, long, broadly ligulate, slightly twisted; lip brownish-mauve; peduncle three or more-flowered. *l.* ligulate, obtuse, green 1882. Hybrid between *C. superbiens* and *C. Stonei.* SYN. *C. Morganæ* (G. C. n. s., xxvi., p. 241; I. H. xxxiv. 5; W. O. A. vii. 313).

C. obscurum (obscure). *fl.*, upper sepal whitish, nerved brown, nearly elliptic, the lateral ones whitish, with ten rows of dark purple spots, much shorter than the lip; lip dark purple-brown, beneath ochre, with brown spots; peduncle hairy, blackish-purple. *l.* ligulate, cartilaginous, green, 1½in. broad. 1887.

C. œnanthum (wine-flowered). *fl.* medium-sized, solitary; dorsal sepal whitish, green at base, with violet nerves, marked with rows of purple blotches; petals port-wine-coloured, flushed violet, yellowish with dark blotches towards the base; lip also port-wine-coloured; scape covered with dark hairs. *l.* ligulate, three-toothed at apex, dark green. A hybrid between *C. insigne Maulei* and *C. Harrisianum.*

C. œ. superbum (superb). *fl.*, dorsal sepal of a deep claret-red, with broad lines of confluent, blackish-purple spots, which become, where they enter the broad, white margin, mauve-purple; lower sepals greenish, with lines and blackish spots on the basal half; petals vinous-red, with darker veins, shading to pale green at the base and apex, ciliated on the upper edge, and with a few blackish spots on the lower edge towards the base. 1885. A garden hybrid between *C. Harrisianum* and *C. insigne Maulei.* (R. G. 1886, 213.)

C. orbum (orb-like). *fl.*, upper sepal lined with purplish-mauve, broad, oblong, the lateral ones much shorter than the lip; petals brownish-purple, spotted blackish, ligulate; lip very large, pale ochre, the base of the sac whitish with greenish veins, the other part purplish-brown; peduncle hairy, less than 9in. high. 1887. Hybrid.

C. orphanum (orphan). *fl.*, dorsal sepal green, triangular, the margin light purple, the mid-nerve purple, the lower ones very short, with ten green nerves; petals "white, with a deep purple mid-line, mostly olive-green, spotted at base," oblong, deflexed, flat; lip purplish-brown in front, yellowish at back, spotted purple on the base, very broad; peduncle very tall. *l.* short and stiff, not marbled. 1886. Garden hybrid.

C. pavonium (peacock-like). *fl.*, median sepal oblong, obtuse, greenish, bordered white, nerved sepia-brown, the base yellow, with blackish blotches; lateral sepals shorter than the lip, whitish, spotted brown; petals ligulate, obtuse-acute, the upper part purplish-brown, the lower part light sulphur-colour, spotted brown; lip slender, the inferior part ochre; peduncle greenish-ochre, with red hairs. *l.* 9in. long, 2in. wide, green, the base of the under side spotted and striped red. A hybrid between *C. venustum* and *C. Boxallii.*

C. Peetersianum (Peeters'). *fl.*, upper sepal white, nerved carmine, half-oblong, obtuse-acute; inferior sepal smaller; petals carmine, with a few dark spots and nerves; lip reddish-brown above, ochre-coloured beneath; peduncle carmine, hairy. *l.* green, with dark nerves. A hybrid between *C. barbatum* and *C. lævigatum.*

C. Pitcherianum (Jas. R. Pitcher's). *fl.*, dorsal sepal whitish, veined green, spotted black and dark purple, 2in. long, acuminate, the lower ones whitish, with broader, green veins; petals whitish, purplish towards the ends, veined green, deflected, 2½in. long; lip purple, with darker veins, 2in. long, the inside yellowish, studded dark purple. Winter. *l.* acute, 5in. long, dark-spotted. Philippine Islands.

C. pleistochlorum (very green). *fl.*, upper sepal nerved purple and green, elliptic, acute, the lateral ones green-nerved, forming a narrow, ligulate, acute body, half as long as the brown, strongly horned lip; petals purple-brown on the anterior part, green-veined above, with a series of brown spots at the side of the sepal, ligulate, apiculate, ciliated; peduncle one-flowered, hairy. *l.* with some dark marks and lines. 1887. Hybrid.

C. plunerum. *fl.*, sepals whitish, marked with dark green nerves, the upper one roundish-triangular, the lateral ones forming a much smaller body; upper part and anterior margin of the lip ochre-coloured, the upper part dark-spotted, the retuse, anterior mouth of the shoe deep brown; peduncle reddish-brown, with very short, mauve hairs. *l.* light green, with hieroglyphic marks on the upper surface. 1887. Hybrid.

C. politum (polished). *fl.*, dorsal sepal whitish, suffused red, varnished, green-nerved, with a central, red bar; petals purplish-red, dotted purple, green towards the base, linear, glossy, finely hairy; lip suffused in front with purplish-red, green-nerved. *l.* large, oblong, acute, light green, with darker tessellations. 1887. A showy hybrid. (G. C. ser. iii., vol. i., p. 765.)

C. porphyrochlamys (purple-cloaked). *fl.*, upper sepal reddish-purple, bordered white, shining, with projecting nerves, transverse, blunt, elliptical; lateral sepals forming a triangular,

Cypripedium—*continued.*

greenish body; petals yellowish at base, freckled mauve-purple on the outer half, descending, broadly ligulate; lip as in *C. barbatum*, but better-coloured. 1884. Hybrid.

C. præstans (excellent). *fl.* nearly as large as those of *Selenipedium grande*; sepals nearly equal, the dorsal one banded green and maroon; petals greenish, suffused rose at base, and spotted maroon along the margins, linear-ligulate, much undulated at base; lip greenish-yellow, with a golden crest, shaped like that of *C. Stonei*, having a very long, channelled stalk; peduncle dark-hairy, five-flowered. Papua, 1884. (G. C. ser. iii., vol. ii., p. 814; I. H. ser. v. 26.)

C. radissum. *fl.*, dorsal sepal white, marked with mauve-purple nerves, which are green at their base and have a green tint between them; the lower ones lined light brown; petals green, with a brown mid-line, and numerous brown spots on the upper margin, the front borders washed brownish; lip as in *C. Lawrenceanum*, brown in front, with a green border. *l.* light green, with dark, transverse markings. 1885. A garden hybrid between *C. Lawrenceanum* and *C. Spicerianum*.

C. regale (royal). *fl.* large; dorsal sepal large, spreading, bright green at base, marked rosy-purple, and nerved bronzy-green, the upper half and margins pure white; petals broadly ligulate, deflexed, slightly incurved, purplish-crimson at base, shading off to rosy-crimson at apex and bordered white; lip claret-coloured, large. 1887. Hybrid between *C. purpuratum* and *C. insigne Maulei*.

C. Röbbelenii (Röbbelen's). *fl.*, upper sepal whitish, nerved purple, narrow; the lower one purplish-white, longer than the lip, with some microscopic purple dots at the base; lip light yellow; staminode light ochre; peduncle hairy. *l.* narrower than in *C. lævigatum* (to which this plant is allied). Philippine Islands, 1883.

C. Rothschildianum (Baron F. de Rothschild's). *fl.*, odd sepal yellowish, with blackish, longitudinal stripes, and white borders, cuneate-oblong, acute; lateral sepals united into one smaller, shorter body; petals yellowish-green, with dark lines, and with dark blotches at base; lip cinnamon-brown, the mouth bordered ochre, very strong, almost bathery; staminode rising erect from a stout base, and bending down into a narrow, beak-like process. *l.* above 2ft. long, from 2½in. to 3in wide, glossy green, very strong. Papua, 1887.

C. Sanderianum (Sander's). *fl.*, sepals yellowish-green, nerved purplish-brown; petals purplish-brown, fading to yellowish, spotted and barred purplish-brown towards the base, where there are some retrorse, purple bristles, linear, twisted, 1ft. to 1½ft. long; lip greenish-bronze, in shape resembling that of *C. Stonei*. Malay Archipelago, 1886. (R. 3)

C. selligerum majus (greater). A fine and handsome plant, with larger flowers than in the type. 1886.

C. Stonei platytænium (broad-bordered). *fl.*, dorsal sepal white, striped purple; petals 4in. to 5in. long, ¾in. broad, curved downwards, whitish outside, spotted and tinted yellow, deep crimson-purple at the tips, the inner surface white, blotched reddish-purple; lip as in the type. (F. M. ser. ii. 414; G. C. 1867, p. 1118; R. X. O. ii. 161; W. S. O. iii. 14.)

C. superciliare (prominently ciliated). *fl.* smaller than in *C. superbiens*; dorsal sepal ovate-triangular; petals ligulate, ciliated, warted and blotched except towards the tip. A hybrid between *C. barbatum* and *C. superbiens*, which latter it closely resembles.

C. Swanianum (Swan's). *fl.* as large as those of *C. barbatum*, long-stalked; dorsal sepal white, veined purplish-crimson, large and broad; petals pale vinous-red, nerved green, broad, bent down, bordered with retrorse bristles, having a few small warts on the upper edge; lip dark crimson-purple, large, warted on the inflected sides of the base. *l.* broadly ligulate, acute, tessellated. A hybrid between *C. Dayanum* and *C. barbatum*. There are one or two varieties of this plant.

C. Tautzianum (Tautz). *fl.*, median sepal white, veined purple, elliptic, acute, the lateral ones similarly coloured, connate; petals nerved and spotted purple; lip dark purple, with warts on the involved side laciniæ, pale beneath towards the base. 1886. Hybrid.

C. Thibautianum (Thibaut's). *fl.*, sepals green, with rows of brown spots, the dorsal one bordered white; petals shining brown, the upper part light green with small, brown spots; lip pale yellowish, the front part brown. 1886. A garden hybrid between *C. Harrisianum* and *C. insigne Maulei*.

C. tonkinense (Tonkin). A variety of *C. concolor*.

C. tonsum (shorn). *fl.*, dorsal sepal whitish, with twenty-one green nerves, a small brown blotch on each border inside, and a green disk outside, the lower sepals half as long as the lip; petals oblong-ligulate, acute, nearly free from ciliæ, green, washed with sepia, and spotted with dark brown; lip greenish, the upper surface washed with sepia. *l.* rather narrow, marked as in *C. Dayanum*. Sumatra or Java, 1883.

C. venustum pardinum (leopard-marked). *fl.*, sepals and petals white, striped green, the petals also blotched dark chocolate; lip greenish-yellow, marked rose. 1887. Perhaps the finest, and certainly the largest-flowered, variety. (G. C. ser. iii., vol. i., p. 382.)

Cypripedium—*continued.*

C. v. spectabile (remarkable). *fl.* solitary; dorsal sepal white, with broad, green stripes; petals greenish-white, streaked deeper green, tipped rose-red; lip greenish-yellow, tinged rose. (W. S. O. iii. 24.)

C. Vervaëtianum (Vervaët's). *fl.*, upper sepal white, greenish at base, transverse, oblong, apiculate, nerved brownish-purple; lower sepals acute, half as long as the lip; lip reddish-brown, angulate on each side; petals deflexed, ciliate at base, with blackish, ocular spots and light purple-brown hairs; peduncle brown with short hairs. *l.* resembling those of *C. Lawrenceanum*, but with the whitish spaces much larger. A hybrid between *C. Lawrenceanum* and *C. superbiens*. 1888.

C. villosum aureum (golden). *fl.* 6in. across; upper part of the dorsal sepal bright-yellow, broadly margined with white. Moulmein. A fine variety.

C. Williamsianum (Williams'). *fl.*, dorsal sepal white, large, with a blackish-brown, central bar, and green nerves; petals reddish-brown on the upper side of the dark brown, median line, and white, with a coppery tint, on the lower side, dotted black near the base, oblong-ligulate, acute, the margins ciliated; lip yellowish beneath, light brown above, with an ochreous border. *l.* distinctly tessellated. 1886. Garden hybrid.

C. Winnianum (Winn's). *fl.*, dorsal sepal whitish-yellow, dark purplish-brown in the centre, oblong, acute, not broad, the lower ones pale ochre; petals reddish on the upper side of the brown mid-line, and yellow on the lower side; lip (and leaves) as in *C. villosum*. 1886. A hybrid between *C. Druryi* and *C. villosum*.

CYRTANDRA (from *kyrtos*, curved, and *aner*, *andros*, a male; alluding to the curved filaments of the perfect stamens). ORD. *Gesneraceæ*. A genus embracing about sixty species of stove trees, shrubs, or sub-shrubs, natives of the Malayan Archipelago and the Pacific Islands. Flowers often whitish or yellowish, fascicled, capitate, or cymose in the axils; calyx free, five-cleft or somewhat five-parted; corolla sub-bilabiate; perfect stamens two; staminodes two or three, small: bracts small, or the outer ones ample. Leaves opposite, one often smaller, or by abortion nearly alternate. For culture of the two species introduced, *see* **Agalmyla**, on p. 35, Vol. I.

C. pendula (pendulous). *fl.* sessile; calyx brownish, ten to eleven lines long; corolla white, dotted purple on the lower side of the inflated part, 1¼in. long, sub-equally five-lobed; peduncle about 6in. long, bent down. *l.* opposite, on long petioles, elliptic or elliptic-lanceolate, acute at apex, acute or sub-cordate at base, blotched grey above. Stem short and stout. Java, 1883.

C. Pritchardii (Pritchard's). *fl.* white, small, disposed in pedunculate, axillary, three-flowered cymes. *fr.* white, ovoid. *l.* petiolate, elliptic, obtusely toothed, acute at both ends, 5in. to 6in. long, 2in. to 2½in. broad. Fiji, 1887.

CYRTANTHUS. To the species described on p. 428, Vol. I., the following hybrid should now be added:

C. hybridus (hybrid). *fl.* light orange-scarlet or bright rosy-carmine. In general appearance this hybrid between *C. sanguineus* and *Vallota purpurea* resembles the latter parent, but the perianth tube is bent forward and rather abruptly dilated in the throat, and the segments are rather narrower. The stamens are short, and the upper ones are curved downwards exactly as in *C. sanguineus*. 1885.

CYRTOCHILUM. This genus is now included, by Bentham and Hooker, under *Oncidium*. To the species described on p. 428, Vol. I., the following should now be added:

C. detortum (distorted). *fl.*, sepals light brown, cuneate-oblong, acute, wavy, the odd one with a little yellow at the upper part; petals yellow, spotted brown, wavy; lip three-cleft, the side laciniæ spreading, triangular, and the mid-lacinia ligulate, acute; peduncle very strong, twisted. *l.* broad-oblong, acute, light green.

C. lutescens (yellowish). *fl.*, dorsal sepal dark brown, with a yellow, recurved margin, much waved at the edge, the stalk very short, with auricles, the lateral ones greenish-brown, acute, longer-stalked; petals with a crisped, yellow limb; lip dark greenish, ligulate, short, the anterior part purple; column greenish, orange, and brown. 1887.

CYRTOPODIUM. This genus embraces upwards of a score species of stove, terrestrial Orchids, inhabiting tropical Asia, Africa, and America. Sepals free, spreading, sub-equal, or the lateral ones broader at base and more or less decurrent into the foot of the column; petals similar to the dorsal sepal, but rather broader and shorter; lip affixed to the base of the column, the chin more or less prominent, the lateral lobes rather broad, the middle one

Cyrtopodium—*continued.*

rounded, entire, two-lobed, or crisped-toothed. Leaves long. To the species described on p. 428, Vol. I., the following should now be added:

C. cardiochilum (cordate-lipped). *fl.* bright yellow, tinged green, nearly 2in. across; sepals and petals broad; lip recurved, the front lobe concave; raceme long, erect, forked at base; scape tall, springing from the root, quite distinct from, and taller than, the leafy stems. *l.* linear-lanceolate, acuminate, plicate. Stems stout, fusiform, curved, sheathed by the bases of the leaves. Native country unknown. (W. O. A. iv. 176.)

C. Regnieri (Regnier's). *fl.* yellow, large; sepals and petals falcate-lanceolate, acute; lip oblong-lanceolate, with a wide, blunt angle on each side at the middle; spur conical; raceme on a tall peduncle arising from the side of the leafy shoot. *l.* oblanceolate. Cochin China, 1886. SYN. *Cyrtopera Regnieri.*

C. Saintlegerianum (Saint Leger's). *fl.*, sepals very pale yellow, blotched brown; petals the same colour, with very few spots at the base; lip sulphur, spotted brown, low, rather short, the side laciniæ broad, oblong, margined brown, the middle one small, obtriangular, retuse; column yellow; inflorescence about 2in. long; bracts small. Paraguay, 1885.

CYRTOSPERMA (from *kyrtos*, curved, and *sperma*, a seed; the seeds are sometimes reniform). ORD. *Aroideæ* (*Araceæ*). A genus embracing about sixteen species of stove, perennial herbs, with tuberous or elongated rhizomes, inhabiting tropical Asia, Africa, and America. Flowers all fertile on an inappendiculate spadix; spathe ovate-lanceolate or oblong, convolute towards the base, at length opening, the lamina straight or twisted; spadix shorter than the spathe, sessile or stipitate, cylindrical or globose. Leaves hastate; petioles elongated, sheathing at base. The few species introduced require similar culture to that recommended for **Alocasia** (which *see*, on p. 50, Vol. I.).

C. Johnstoni (Johnston's). This is now the correct name of the plant described on p. 50, Vol. I., as *Alocasia Johnstoni.*

C. Martveieffianum (Martveieff's). Probably identical with **Lasia spinosa** (which *see*).

CYTISUS. To the species described on pp. 429-30, Vol. I., the following should now be added:

C. Andreanus (André's). A beautiful and distinct variety of the common Broom, having deeper golden flowers, with bright red keels instead of yellow, as in the ordinary form. Found wild in Normandy, 1886. (R. H. 1886, p. 372, under name of *Genista Andreana.*)

C. filifer (thread-bearing). A synonym of *Genista sibirica filifer.*

DACTYLIS CÆSPITOSA. A synonym of **Poa flabellata** (which *see*).

DÆDALACANTHUS (from *dædalos*, various-coloured, and *Acanthus*, to which it is related). SYN. *Eranthemum* (in part). ORD. *Acanthaceæ.* A genus comprising fourteen species of stove, erect, glabrous or pubescent shrubs or sub-shrubs, natives of the East Indies and the Malayan Archipelago. Flowers blue, pink (or white?), sessile in the axils of opposite bracts, bibracteolate, forming dense or interrupted spikes; calyx deeply five-lobed or five-parted; corolla tube elongated, slender, incurved above, the limb oblique, spreading, five-lobed; perfect stamens two. Leaves entire or scarcely toothed. *D. macrophyllus* is an erect, minutely pubescent, stove, perennial herb. "It belongs to a class of Acanthaceous plants that are very suitable for winter decoration, flowering freely under proper treatment, which consists very much in careful watering at the time when, in their native country, little or no rain falls" (Sir J. D. Hooker). For culture, *see* **Eranthemum,** on p. 518, Vol. I.

D. macrophyllus (large-leaved). *fl.*, calyx minute; corolla pale violet-blue, 1¼in. to 1½in. long, the limb about ⅔in. in diameter; spikes long-pedunculate, strict, erect, ⅔in. long, narrow; bracts ⅓in. to ⅔in. long, loosely imbricated. Winter. *l.* petiolate; lower ones 5in. to 9in. long, elliptic-lanceolate, acuminate, the base decurrent on the petiole, the margins sometimes obscurely serrulate or denticulate. *h.* 2ft. to 3ft. Birma. (B. M. 6686.)

DAHLIA. To the species and varieties described on pp. 432-7, the following should now be added:

D. arborea (tree-like). A synonym of *D. excelsa anemonæflora.*

D. excelsa anemonæflora (Anemone-flowered). *fl.-heads* 4in. across; ray florets soft lilac, flat; disk of lilac or yellow, tubular florets. *l.* large, bipinnate; petioles broadly connate. *h.* 12ft. to 20ft. Mexico, 1883. This variety requires to be grown in a cool conservatory. (B. ii. 88; G. C. n. s., xix., p. 60.) SYN. *D. arborea.*

Varieties. The Dahlia has been greatly improved during the last few years—in fact, the progress lately made has been astonishing. Since Vol. I. was published quite a transformation has been effected in the Cactus and Semi-Cactus varieties. The single varieties have also become very popular. The following are selected lists of the new varieties in the various sections:

Show Varieties. BENDIGO, purplish-crimson; COLONIST, chocolate and fawn, distinct colour; CRIMSON KING, rich crimson-scarlet; DEFIANCE, deep scarlet; DIADEM, crimson; ECLIPSE, orange-scarlet; ETHELWIN, dark purple, constant; FLORENCE, deep yellow, handsome form; GOLDEN EAGLE, yellow, tipped scarlet; ILLUMINATOR, dark red, shaded orange; KING OF PURPLES, rich purple, well-formed flowers; LUSTROUS, scarlet-crimson shade, good form; MAJOR CLARKE, dark chocolate, good form; MRS. EDWARD MANLEY, primrose; MRS. FOSTER, fawn ground, shading to salmon and mauve, large flowers; MRS. JAMES GRIEVE, yellow, finest form; MRS. PETER MCKENZIE, yellow ground, carmine shaded and edged; NELLIE CRAMOND, cerise, with purple; NELLIE TRANTER, clear yellow, excellent form; PRIMROSE DAME, primrose-yellow; PURPLE PRINCE, rosy-purple, large; QUEEN OF THE BELGIANS, pink, with cream; ROBINA, deep rose, very bright; ROYALTY, pale yellow, tinged with purple; R. T. RAWLINGS, clear yellow, good form; SUNLIGHT, bright scarlet, large; THE AMEER, dark maroon, shaded rosy-purple; VICTOR, dark maroon, constant; WALTER, deep crimson and maroon; WILLIE GARRETT, cardinal-red, well-formed flowers.

Fancy Varieties. DOROTHY, fawn, flaked deep maroon; EDMUND BOSTON, orange, heavily flaked and striped crimson; FRANK PEARCE, rose, striped crimson; HARTIE KING, orange, with scarlet and crimson stripes; MAGNET, densely striped rich purple; MARGERY, buff, striped crimson and purple; PLUTARCH, buff ground, striped crimson; PRINCE HENRY, lilac, striped purple, large.

Bouquet Varieties. CHAMELEON, deep yellow, edged lake; DANDY, crimson-purple, small; DON JUAN, maroon, small, neat; ECCENTRIC, chestnut, splashed white, creamy-yellow and chestnut, variable; GAZELLE, pale yellow ground, edged rosy-magenta; GRACE, cerise, shaded lilac, very free-flowering; HECTOR, scarlet, very bright; IOLANTHE, orange and buff, tipped white; ISEULT, clear yellow, very pretty; JANET, salmon, distinct colour; LADY JANE, pale purple, good form; LEILA, reddish-buff, tipped white; MIGNON, crimson-scarlet; WILLIAM CARLISLE, blush, tipped rosy-crimson.

Single Varieties. BRIGHTNESS OF SUNNINGDALE, scarlet-crimson; CHILWELL BEAUTY, yellow, striped scarlet; DINAH GRUILLEMANS, rosy-lake, lemon-scented; ECLIPSE, scarlet-crimson and orange; EXCELSIOR, white, lilac edge; FAUST, reddish-crimson, well-formed flowers; FLORRIE FISHER, deep mauve, white centre; HUNTSMAN, orange-scarlet; J. H. BRAZENDALE, chocolate, edged magenta; JOHN DOWNIE, crimson; LORD IDDESLEIGH, crimson-maroon, dark centre; LOTTIE HIGGINS, rosy-purple, lemon centre; MADAME CARNOT, yellow, striped crimson; MARIE LINDEN, scarlet, edged crimson; MAUDE MILLETT, pink, white centre; MISS BATEMAN, carmine-red; MISS GORDON, purplish-crimson; MISS HENSHAW, pale yellow, white margin; MISS JANSON, purplish-magenta; MISS LOUISE PRIOR, velvety-crimson, flaked lake; MISS ROBERTS, bright yellow; MONTE CRISTO, rosy-scarlet; MR. RILEY, purplish-magenta; MR. ROSE, bright rose, striped white; MRS. BARKER, buff, shaded red; MRS. CLEVELAND, terra-cotta red; MRS. DANIELS, white, edged crimson; MRS. JOHN LAMONT, white, purplish-rose edge; MRS. ABERY, pure white, edged crimson; NEW YEAR, rosy-lake; PENELOPE, rose-lake, shaded salmon-pink; ROBERT HUTCHINSON, crimson, purple tinge; ROBERT TODD, yellowish-buff, striped scarlet; VICTORIA, crimson; W. T. BASHFORD, rosy-purple; YELLOW GEM, clear yellow, fine form.

Cactus and Semi-Cactus Varieties. CHARMING BRIDE, white, tipped pink; EMPRESS OF INDIA, crimson, shaded maroon; FLAMBEAU, scarlet, shaded orange; HENRY PATRICK, white, recurved petals; KING OF THE CACTUS, large, reddish-crimson; LADY ARDILAUN, scarlet and crimson, fine; LADY KERRISON, yellow, edged crimson; LADY M. MARSHAM, deep salmon; LILIAN ABERY, yellow, red edge, very pretty; SIR TREVOR LAWRENCE, cherry-red, purple shade; WILLIAM DARVILL, purplish-magenta; WILLIAM PEARCE, bright yellow; WILLIAM RAYNER, salmon-buff; YELLOW A. W. TAIT, bronzy-yellow; YELLOW JUAREZII, pale yellow; ZULU, purple-maroon.

DASYLIRION. About eight species, natives of Mexico-Texan North America, have been referred to this genus. To those described on pp. 442-3, Vol. I., the following should now be added:

D. quadrangulatum (four-angled). *fl.* small, disposed in a dense, spike-like panicle; flower-stem about 5ft. high. *l.* slender, quadrangular, about 2ft. long. Stem stout, about 3ft. high, crowned with a dense tuft of leaves. Texas, 1887. Stove or greenhouse. (R. G. 1887, p. 280.)

Davallia—*continued.*

D. elegans polydactyla (many-fingered). This differs from the type in the many-fingered, dilated apex of the frond, and of the pinnæ, which are all multifidly divided or crested in such a manner as to give the plant an extremely ornamental character. 1882.

D. ferruginea (rusty). *sti.* wide-creeping, climbing, not prickly. *fronds* quadripinnatifid; pinnules of the lower pinnæ 2in. to 3in. long, 1½in. broad, ovate; segments 1in. long, ⅔in. broad, cut down to the rachis below, the lobes ¼in. to ⅜in. broad, cuneate at base

FIG. 14. DAVALLIA TENUIFOLIA VEITCHIANA.

DAVALLIA. To the species described on pp. 445-7, Vol. I., the following should now be added:

D. aculeata (prickly). *rhiz.* creeping, stout, fibrillose. *sti.* (including rachis) 4ft. to 6ft. long, strong, scandent, spinose-flexuose. *fronds* tripinnatifid; lower pinnæ 1ft. to 1½ft. long, 4in. to 6in. broad, ovate-lanceolate; pinnules lanceolate, 2in. to 3in. long, 1in. broad; segments ¼in. broad, cuneate, deeply two to four-lobed. *sori* small, cup-shaped, terminal. West Indies. SYN. *Stenoloma aculeata.*

D. brachycarpa (short-fruited). A form of *D. gibberosa.* both deeply toothed and shallowly crenate. *sori* small, marginal, shallow. Madagascar, 1887. SYN. *Stenoloma ferruginea.*

D. fijensis plumosa (feathery). In this variety the segments are extremely narrow, and all parts of the frond have a specially graceful, plumose appearance. 1882.

D. fœniculacea (Fennel-like). *sti.* erect, firm, 6in. to 8in. long. *fronds* 9in. to 18in. long, 6in. to 12in. broad, lanceolate-deltoid, quadripinnate; lower pinnules lanceolate, acuminate, 2in. to 3in. long, 1in. broad; segments cut down to the rachis into simple or forked, linear, filiform, ultimate divisions, one to two lines long,

Davallia—*continued.*

equalling the rachis in breadth. *sori* two to six to a segment, lateral, deeply half-cup-shaped. Fiji Islands, 1885.

D. gibberosa brachycarpa (short-fruited). *sori* as broad as deep, overtopped by a long horn. New Hebrides, 1884. SYN. *D. brachycarpa.*

D. hirta cristata (crested). *fronds* drooping, beautifully crested. South Sea Islands.

D. Lorrainii (Lorraine's). *rhiz.* as thick as a quill, the scales nearly black. *sti.* 3in. to 4in. long, brownish, naked. *fronds* 6in. to 12in. long, deltoid, quadripinnatifid; pinnæ stalked, deltoid, the lowest largest, produced on the lower side, their rachises winged to the base; pinnules and segments sub-sessile, crowded, deltoid, much reduced on the lower side; final lobes ligulate, a quarter to one-third of a line broad, with a sorus at the base of the inner side. Malay Peninsula, 1882.

D. retusa (retuse). *sti.* pale reddish. *fronds* deltoid, tripinnate; pinnules pale green, rhomboidal or cuneate. Sumatra, 1886. An elegant Fern, of spreading habit, suitable for basket culture.

D. tenuifolia Veitchiana (Veitch's). *fronds* spreading, plume-like, broadly ovate, quadripinnate; ultimate lobes cuneate, simple or bifid, China, 1883. A handsome basket Fern. See Fig. 14, for which we are indebted to Messrs. James Veitch and Sons.

DELPHINIUM. This genus comprises about forty species, distributed over the North temperate zone. To the species and varieties described on pp. 450-1, Vol. I., the following should now be added:

D. azureum album (white). *fl.* creamy-white, in long, wand-like racemes. *l.* large, deeply three to five-parted, the divisions cleft into narrow lobes. Stems 2ft. to 3ft. high. North America, 1882.

D. cashmirianum Walkeri (Walker's). *fl.* 1in. or more in diameter; sepals pale blue, striped with darker blue; petals dull yellowish, tipped with brown; peduncles 3in. to 4in. long, one-flowered. *l.* orbicular, three to five-lobed; lobes lobulate. Kashmir, 1885. A dwarf, rockwork plant. (B. M. 6830.)

D. hybridum sulphureum (sulphur). A synonym of *D. Zalil.*

D. Zalil (Zalil). *fl.* pale yellow, rather larger than a shilling, disposed in long racemes. May to August. *l.* dark green, finely cut. Stem branching; branches 8in. to 16in. long. Afghanistan, 1887. An attractive annual. SYN. *D. hybridum sulphureum.*

DENDRAGROSTIS. A synonym of **Chusquea** (which *see*).

DENDROBIUM. This genus is here revised in accordance with the admirable monograph recently published by Messrs. James Veitch and Sons, in Part III. of their "Manual of Orchidaceous Plants." To the species, varieties, and hybrids described on pp. 452-8, Vol. I., the following should now be added:

D. æmulum (emulous). *fl.* white, fragrant, 1½in. across, the apical half of the segments sometimes stained pale yellow; sepals narrow-lanceolate; petals linear; lip very short, three-lobed, the side lobes acute, spotted pink, the middle one reflexed; racemes terminal, lax, five to seven-flowered. Stems terete, 2in. to 4in. or more in length, sometimes tapering to a long, thin base with a small pseudo-bulb, and bearing at their summit two or three very coriaceous leaves. Australia. (B. M. 2906; F. A. O. i., part ii. 5.)

D. Ainsworthii roseum (rosy). *fl.* deeper-coloured than in the type; sepals and petals rosy-magenta; lip amaranth-crimson, with a dark spot, feathered at the edge, veined deeper crimson. February and March. (W. O. A. i. 20.)

D. amethystoglossum (amethyst-lipped). *fl.* ivory-white except the amethyst-purple anterior lobe of the lip, crowded, about 1in. in diameter; sepals and petals ovate-oblong, acute; lip elongated, linear-spathulate, apiculate, convex in the middle, incurved at the margins except towards the apex; spur long, obtuse; column exposed; racemes 3in. to 5in. long, many-flowered. January and February. *l.* sessile, oval-oblong, sub-acute. Stems robust, sometimes 2ft. to 3ft. high and nearly 1in. thick. Philippine Islands, 1872. (B. M. 5968.)

D. antelope (antelope-horned). *fl.* yellowish; sepals ligulate-triangular, acute; petals long, antenniform, upright, painted sepia inside; lip striped and speckled mauve, the square anterior lacinia having its abrupt apiculus short. Moluccas, 1883. Stove.

D. arachnites (cobwebby). *fl.* bright cinnabar-red, in fascicles of two or three, but sometimes solitary, 2½in. across when spread out; sepals and petals linear, acute; lip veined purple, shorter than the other segments, sub-pandurate, convolute over the column at the base; column very short. *l.* linear-lanceolate, acute, 1½in. to 2½in. long. Stems terete, 2in. to 3in. long. Moulmein, 1874. Very rare in cultivation.

D. aurantiacum (orange). A synonym of *D. aureum aurantiacum.*

D. aureum album (white). *fl.* very pale, nearly white.

Dendrobium—*continued.*

D. a. aurantiacum (orange). *fl.* orange-yellow. The richest-coloured of all the varieties. SYN. *D. aurantiacum.*

D. a. Henshalli (Henshall's). *fl.*, lip white, suffused yellow at base, where there are two reddish-purple spots. (B. M. 4970, under name of *D. heterocarpum Henshalli.*)

D. a. pallidum (pale). *fl.* sometimes smaller than in the type; lip white, with the exception of a yellow stain at base. Stems longer and slenderer. (B. R. 1839, 20.)

D. bracteosum (bracteate). *fl.* purple, with a yellow lip, marked reddish on the front margins, grouped in capitate masses; sepals triangular-keeled, the spur about two-fifths the length of the free part of the lateral sepals, rather blunt; petals narrower, oblong, acute; lip nearly spathulate, a little convex on the upper sides, much thicker at the base; bracts nearly as long as the flowers. New Guinea, 1886. (L. ii. 74.)

D. Brymerianum histrionicum (actor). *fl.*, lip having "sometimes a beard, sometimes none, like a comedian." Autumn.

D. calamiforme (Calamus-like). A synonym of *D. teretifolium.*

D. Calceolaria (Calceolaria-like). This is now regarded as a variety of *D. moschatum.*

D. capillipes (hair-stemmed). *fl.* bright golden-yellow, in short racemes. *h.* 6in. Moulmein. A curious species, resembling a pigmy form of *D. albo-sanguineum.* It succeeds on a block or in a basket. (R. X. O. ii. 169, f. 4-6.)

D. cariniferum lateritium (brick-red). *fl.*, sepals light yellow; petals white; lip brick-red, with a yellowish front lobe. 1883.

D. c. Wattii (Watt's). *fl.* larger than in the type, white, with parts of the lip yellow, the middle lobe of the lip longer than in the type, two-lobed. *l.* narrower, with nearly smooth sheaths. (B. M. 6715.)

D. chloropterum (green-winged). *fl.*, sepals and petals light green, streaked red outside, and with broken lines of darker colour inside; lip light reddish, with darker lines, the front lobe with a light yellowish border, the callus white; column whitish; peduncle loosely few-flowered. *l.* narrow-oblong, bilobed at apex. Pseudo-bulbs fusiform. New Guinea, 1815. (J. B. 1878, 196.)

D. chlorostele (green-columned). *fl.* bold and stiff; sepals white, edged purple, ligulate, acute; petals broad, blunt, the outer halves purple, the interior white; lip shaped like that of *D. Wardianum,* with a strong, light, square cushion at the base, and an amaranth-coloured, radiating area around, bordered outside with light sulphur, the apicular zone bright purple. 1887. A hybrid between *D. Linawianum* and *D. Wardianum.*

D. chrysanthum anophthalmum (eyeless). A distinct variety, having no blotches on the lip. 1883.

D. chryseum (golden). *fl.* golden-yellow, almost orange, with a few faint crimson lines on the side lobes of the lip, solitary or in racemes of two or three; sepals oblong; petals broadly elliptic, almost as broad again as the sepals; lip orbicular, pubescent, with a minutely fimbriated margin, obscurely three-lobed, the small side lobes rolled over the very short column; spur short, obtuse. *l.* from the uppermost joints only, linear-lanceolate, 3in. to 4in. long. Stems terete, erect, 1ft. to 2ft. high. Assam (?).

D. chrysocrepis (golden slipper). *fl.* golden-yellow, with a deeper lip, 1½in. in diameter, solitary on short, slender peduncles from old, leafless stems; dorsal sepal and petals similar, obovate, concave; lateral sepals ovate, more spreading; lip somewhat pear-shaped, ventricose, velvety, the inner surface densely clothed with reddish hairs. March. *l.* three or more, elliptic-lanceolate, pointed, 2in. to 3in. long. Stems slender, 6in. to 10in. long, dilated above into flattened, leafy pseudo-bulbs. Moulmein, 1871. (B. M. 6007.)

D. Chrysodiscus (yellow-disked). *fl.*, sepals and petals whitish, blotched purple at apex; lip light sulphur-white, with a velvety, white, thickened cushion at base, a large orange area around, purple lines radiating from the cushion, the acute apex purple. 1887. A hybrid between *D. Ainsworthii* and *D. Findlayanum.*

D. C. oculatum (eyed). *fl.*, sepals and petals having a larger and deeper apicular blotch; lip with a deep maroon disk, surrounded by a bright yellow zone.

D. chrysotoxum suavissimum (very sweet-scented). The correct name of the plant described on p. 457, Vol. I., as *D. suavissimum.*

D. ciliatum (ciliated). *fl.* 1in. across, many in pseudo-terminal and lateral racemes; sepals and petals pale yellow, the former linear-oblong, the lateral two falcate, the petals linear, dilated at apex; lip deep yellow, streaked obliquely with reddish-brown from either side of the trilamellate disk, obscurely lobed, triangular, incurved at the sides, the anterior lobe yellow-ciliate. October and November. *l.* sessile, oval-oblong, gradually narrowing upwards, 3in. long, deciduous. Stems tufted, 1ft. to 1½ft. or more in length. Moulmein, 1863. (B. M. 5430.)

D. cœrulescens (bluish). A variety of *D. nobile*

D. crassinodi-Wardianum (hybrid). *fl.* like those of *D. crassinode Barberianum,* but with two dark eye-spots; lip less acute than in *D. Wardianum.* 1886. This is supposed to be a natural hybrid between *D. Wardianum* and *D. crassinode.* SYN. *D. melanophthalmum*

Dendrobium—*continued.*

D. cruentum (blood-red). *fl.* whitish, with a strongly-marked, cinnabar callus; sepals triangular, acuminate, the lateral ones with a nearly rectangular chin; petals linear, acuminate; lip deeply trifid, the side laciniæ falcate, erect, the middle one ovate, apiculate; column broader at the base than at the tridentate top. *l.* oblong, obtuse, bilobed. Stems sulcate. 1884. (W. O. A. 174.)

D. cucullatum giganteum (gigantic). A synonym of *D. primulinum giganteum.*

D. cumulatum (crowded). *fl.* rosy-purple, suffused white, 1in. in diameter, collected into crowded, sub-globose corymbs: sepals and petals oblong; lip obovate-oblong, longer and broader than the petals, prolonged at base into a slightly curved, obtuse spur; rachis and pedicels deep reddish-purple. Autumn. *l.* oblong, acuminate, 3in. to 4in. long. Stems tufted, slender, pendulous, 1½ft. to 2ft. long. Moulmein, 1867. (B. M. 5703.)

D. Curtisii (Curtis'). *fl.* magenta-rose, produced in short racemes. Stems tall, erect, slender, leafless; younger shoots furnished with linear-lanceolate leaves. Borneo, 1882.

D. Cybele (Cybele). *fl.*, sepals and petals white, slightly tipped with light rose-colour; lip nearly white, slightly suffused with pale yellow, and having a large blotch of deep crimson-purple at the base. 1887. A hybrid between *D. Findlayanum* and *D. nobile.*

D. cymbidioides (Cymbidium-like). *fl.* medium-sized, showy; sepals and petals ochreous-yellow, linear-oblong, spreading; lip white, blotched purple near the base, much shorter than the sepals and petals, oblong-cordate, three-lobed, bearing on the disk tubercles arranged in two or three lines or series, the side lobes short, incurved, the terminal lobe ovate, obtuse; column short; peduncles terminal, erect, loosely racemose, five to seven-flowered. Pseudo-bulbs ovate or oblong-ovate, angled, bearing at the summit two oblong, obtuse, coriaceous leaves, longer than the pseudo-bulbs. Salak, Java, 1852. A rare species. (B. M. 4755.)

D. dactyliferum (finger-bearing). *fl.* ochreous-white; sepals lanceolate, longer than the petals; side laciniæ of the lip long and narrow, going out into angles, quite approximate to the thick, square, emarginate, anterior blade. Upper parts of the stems covered with old, thickish peduncles, the lower parts full of roots. 1884.

D. D'Albertisii (D'Albertis'). *fl.* odorous, distinctly spurred; sepals pure white; petals emerald-green, long, narrow, erect, twisted; lip striped magenta-purple; racemes erect. Stems square, tapering. New Guinea. A dwarf species. (G. C. n. s., x., p. 217.)

D. Dearei (Col. Deare's). *fl.* white, 2½in. in diameter, on whitish pedicels; sepals lanceolate, acuminate, with recurved tips; petals oval, nearly three times as broad as the sepals; lip oblong, obtuse, obscurely three-lobed, with a pale yellowish-green, transverse zone between the base and the anterior margin; peduncles racemose. July and August. Stems robust, 2ft. to 3ft. long, the upper third clothed with sessile, oval-oblong leaves, 2in. long. Philippine Islands, 1882 (M. O. iii., p. 37; W. O. A. iii. 120.)

D. densiflorum Walkerianum (Walker's). *fl.*, racemes 2ft. long, more than fifty-flowered. Stems 3ft. high. Moulmein. (W. S. O. iii. 21.)

D. erythropogon (red-bearded). *fl.* whitish-ochre and ochre, the keels on the mid-lines well-developed; petals oblong, undulated; side laciniæ of lip white, edged crimson, much developed, blunt, rectangular, the middle one obcordate, toothleted, with seven thick, crimson keels on the disk, the two outer ones having short, crimson hairs on each side; column nearly white, with two scarlet spots at base. Sunda Islands, 1885.

D. euosmum (richly-scented). *fl.* cream-coloured, marked purple, powerfully scented; tips of the middle sepal and of the petals purple; lip with a rich purple disk and apex, and some purple, parallel veins on each side. 1885. A hybrid between *D. endocharis* and *D. nobile.*

D. e. leucopterum (white-winged). A beautiful hybrid, raised from the same capsule as *D. euosmum*, but the flowers are larger, with white sepals and petals, and the disk of the lip is of a rich purple. 1886.

D. e. roseum (rosy). *fl.*, sepals and petals toned with rose-purple, which is of a much deeper shade at the apex; apical blotch on the lip deeper than in the type.

D. Farmeri albiflorum (white-flowered). *fl.*, sepals and petals almost pure white; lip orange, downy. India. (B. H. 1860, p. 321.) SYN. *D. F. album* (R. G. 595.)

D. F. album (white). A synonym of *D. F. albiflorum.*

D. F. aureum (golden). *fl.* clear yellow, with an orange-yellow lip, freely produced in rich racemes. Moulmein, 1883. A charming variety, of dwarf habit. (W. O. A. iii. 99.)

D. formosum Berkeleyi (Berkeley's). *fl.* scentless, more funnel-shaped than those of the type; petals narrower and shorter. Andamans, 1883.

D. f. giganteum (gigantic). *fl.* 6in. in diameter; lip 2in. broad, with a bright golden blotch. Stems reaching 3ft. in length. Upper Birma, 1882. A very fine variety. (G. C. n. s., xvii., p. 369.)

D. Friedricksianum (Friedricks'). *fl.* light yellow, with a darker yellow centre to the lip, where there is a dark purple, semicircular blotch, resembling those of *D. aureum* in shape; lip rolled around the column, oblong, full of asperities on the disk, and with a clavate line in front of the base; raceme four-flowered, slender. Stem rather thick, much-furrowed. Siam, 1887.

D. fuscatum (fuscous). *fl.* deep orange-yellow, 2in. across; sepals and petals oblong, somewhat incurved; lip shorter, broadly oblate, cucullate, with two crimson spots at base, downy, the margins fringed; racemes produced from the nodes of the leafless stems, drooping, 4in. to 7in. long, sometimes fifteen-flowered, the rachis zigzag. *l.* lanceolate or ovate-lanceolate, acuminate, 4in. to 6in. long. Stems fascicled, grooved, 2ft. to 3ft. long. Khasya and Sikkim. (B. M. 6226.)

D. Fytchianum roseum (rose-coloured). *fl.* rose-coloured, about 1½in. in diameter, having processes on the lip of a rich purple. Birma, 1887. (W. O. A. 336.)

D. Goldiei (Goldie's). *fl.* rich claret-purple; sepals lanceolate, with dark tessellations; petals whole-coloured, broader, oblong; lip whole-coloured, longer and narrower than in *D. superbiens* (which this plant resembles). *l.* longer and narrower. Stems taller and slenderer. Torres Straits. (Gn. xiv., p. 244.)

D. Griffithianum Guibertii (Guibert's). *fl.* larger and brighter-coloured than in the type; racemes longer. *l.* more coriaceous. Stems less densely tufted and more abruptly attenuated below. (I. H. ser. iii. 258; R. H. 1876, p. 431, under name of *D. Guibertii.*)

D. Guibertii (Guibert's). A variety of *D. Griffithianum.*

D. Hanburyanum (Hanbury's). A synonym of *D. lituiflorum.*

D. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ.*

D. Harveyanum (Harvey's). *fl.* deep chrome-yellow, with two orange blotches on the lip; chin short, emarginate; sepals triangular-lanceolate, acute; petals oblong, acute, fringed; lip round, a little involved at base, with strong fringes, a rough surface, and an obscure callus at base; peduncle lateral, filiform, four-flowered. Pseudo-bulbs fusiform, 6in. long. Birma, 1883.

D. Hasselti (Hasselt's). *fl.* pale purple; dorsal sepal lanceolate, the lateral ones connate in a sac; lip linear, acute. *l.* rigid, lanceolate, deeply and obliquely emarginate. Stems erect. 1885. (I. H. 1885, 545.)

D. Henshallii (Henshall's). A variety of *D. aureum.*

D. hercoglossum (fence-lipped). *fl.* similar to those of *D. aduncum*, but with a more oblique spur; sepals and petals delicate mauve; lip white, with a mauve-purple, recurved apex, the basal part cup-shaped, hairy inside, separated from the front part by a transverse fringe of hairs. Stems slender, bearing lateral racemes at the top. Malacca, 1886.

D. Hillii (Hill's). A variety of *D. speciosum.*

D. Hookerianum (Hooker's). The correct name of the plant described on p. 452, Vol. I., as *D. chrysotis.* (I. H. 1873, 155; W. S. O. iii. 6.)

D. Huttonii (Hutton's). *fl.* white, bordered purple, solitary or in fascicles of two or three from the uppermost joints; sepals and petals oval-oblong; lip obovate-oblong, with a deeper-coloured border than on the sepals and petals. *l.* sessile, linear-lanceolate, acute, 3in. long. Stems slender, erect, 20in. to 30in. long, leafy along the upper half. Malayan Archipelago, 1868.

D. inauditum (incredible). *fl.* two, arising from the base of the leaf; sepals and petals pale yellowish, 1½in. long, narrow linear-lanceolate; lip pale ochreous, spotted brown, the side lobes square, obtuse, the front one lanceolate, acuminate; pedicels (including the ovary) about 2in. long. *l.* elliptic, obtuse. Pseudo-bulbs tufted, fusiform-ovate, narrowed at apex into a slender, brownish leaf-stalk 3in. to 4in. long. New Guinea, 1886. A singular species.

D. infundibulum carneo-pictum (flesh-colour-painted). A variety having a flesh-coloured hue on the lip, and a thick central line and a few streaks on the sides. 1885.

D. i. Jamesianum (James Veitch's). The correct name of the plant described on p. 454, Vol. I., as *D. Jamesianum.*

D. i. ornatissimum (very ornamental). *fl.* large, waxy, having brown stripes and spots on the lip instead of yellow. 1885. A grand variety.

D. ionopus (purple-spurred). *fl.* deep yellow; sepals triangular, the lateral ones elongating in a falcate chin; lip marked with a few purple and red blotches, and with a red hue along the thicker back of the falcate, spur-like extension of the disk; raceme short. Birma (?), 1882.

D. japonicum (Japanese). *fl.* white, speckled purple at base of lip, fragrant, 1½in. in diameter, solitary or in pairs; sepals oblong, acute; petals similar but broader; lip ovate-oblong, acuminate, reflexed. *l.* linear-lanceolate, acute, 1in. to 2in. long, deciduous. Stems tufted, 6in. to 12in. long, slender, attenuated downwards. Southern Japan, 1860. (B. M. 5482.)

D. Johannis semifuscum (half-fuscous). *fl.*, sepals yellow; petals brown; lip yellow, with reddish-brown borders and lines on the side lobes. 1883.

D. leucolophotum (white-haired). *fl.* white, resembling those of *D. barbatulum*, but much larger; chin small, acute; sepals

Dendrobium—*continued.*

ligulate, acute; petals much larger, oblong, acute; lip trifid, the side laciniæ triangular, rounded outside, the anterior one linear-ligulate, acute; inflorescence lax, more than 1ft. long. *l.* oblong-ligulate, acuminate. Stems cylindrical, attenuated, many-leaved. Sunda Islands, 1882.

D. leucopterum (white-winged). A variety of *D. euosmum.*

D. linearifolium (linear-leaved). *fl.* white; upper sepals small, oblong, acute, the lateral ones having two mauve-purple lines; petals very small, nearly rhombic; lip cuneate-dilated, or blunt-retuse or trilobed at apex with rhombic side lobes and a retuse middle one, the side lobes veined purplish-mauve. *l.* linear, bidentate, more than 2in. long. Stem thin, slender, bearing numerous branches. Java, 1883.

D. linguella (small-tongued). *fl.* probably rosy, the anterior part of the lip yellow, closely resembling those of *D. aduncum*, but the lip is totally distinct in its double, lamellar appendages at the base. Malayan Archipelago, 1882.

D. Loddigesii (Loddiges'). This is the correct name of the plant described on p. 457, Vol. I., as *D. pulchellum.* (B. i. 5; L. B. C. 1935.)

D. Lowii pleiotrichum (several-haired). A variety wanting the red veins on the lip, and having short hairs on the basal lobes. 1885.

D. luteolum chlorocentrum (yellowish-spurred). *fl.* pale primrose, having greenish hairs on the disk of the lip. 1883. (G. C. n. s., xix., p. 340.)

D. Macfarlanei (Rev. S. M. Macfarlane's). *fl.* 4in. to 5in. across; sepals and petals white, the former lanceolate, the latter longer and broader, sub-rhomboidal, acuminate; lip nearly as long as the petals, three-lobed, the side lobes white, with a large, purple spot at the anterior margin, the middle lobe white, purple at base, as is the ligulate, furrowed callus; column white, bordered purple; racemes ascending, nine to twelve or more-flowered. *l.* oblong, sub-acute, leathery, 3in. to 4in. or more in length. Stems erect, sub-cylindric, 5in. to 8in. high, usually two or three-leaved. Papua, 1882. (M. O. iii., p. 159.)

D. macrophyllum Dayanum (Day's). A superior variety. Borneo.

D. m. giganteum (gigantic). *fl.* solitary or twin, 4in. in expanse; sepals and petals rosy-mauve, tinted lilac, the eye (as well as the fringed lip) rosy-purple. Manilla, 1886.

D. m. stenopterum (narrow-winged). In this variety the sepals and petals are ochreous-yellow, the outside being marked with dark reddish-brown spots; the lip is yellow, with numerous dark brown dots on the outside and rather pale markings on the inside of the mid-lacinia, the side laciniæ being marked with a few brown lines, and being narrow-triangular in shape instead of irregularly square.

D. m. Veitchianum (Veitch's). The correct name of the plant described on p. 455, Vol. I., as *D. macrophyllum.*

D. marginatum (margined). A synonym of *D. xanthophlebium.*

D. melanodiscus (dark-disked). *fl.* resembling those of *D. Ainsworthii*; sepals and petals marked purple at the top; lip having a poor purple spot at the top. 1887. Hybrid.

D. melanophthalmum (dark-eyed). A synonym of *D. crassinodi-Wardianum.*

D. mesochlorum (green-centred). *fl.* 1½in. across, in fascicles of two or three; sepals and petals white tinted pale rose-purple towards the tip, the former linear-oblong, the latter oval-oblong; lip white, with a large, yellowish-green disk, and a few purple streaks near the base, clawed, broadly oblong, rolled over the column in the form of a funnel. May. *l.* linear, acute, 4in. to 5in. long. Stems slender, 15in. to 20in. long. India, 1847. (P. F. G. i., p. 63.)

D. micans (glittering). *fl.* about 3in. in diameter; sepals and petals mauve-purple, paler towards the base; lip white, with a maroon-purple disk, and a rose-purple blotch at apex. A hybrid between *D. Wardianum* and *D. lituiflorum.*

D. Moorei (Chas. Moore's). *fl.* pure white; sepals and petals linear-lanceolate; lip similar but shorter, and with a small, triangular lobe on each side below the middle; scapes filiform, bearing at their apex a raceme of six to ten flowers. Stems terete, 4in. to 6in. long, with three to five oval-oblong, leathery leaves at their apex. Lord Howe's Island, 1878. A dwarf, tufted species.

D. moschatum Calceolaria (slipper-like). The correct name of the plant described on p. 452, Vol. I., as *D. Calceolaria.*

D. moulmeinense (Moulmein). A synonym of *D. infundibulum.*

D. murrhiniacum (purplish). *fl.*, sepals and petals snow-white, tipped purple; lip with a large, purple, obcordate blotch at base of disk, some darker lateral stripes, and a light purple apex. A hybrid between *D. nobile* and *D. Wardianum.*

D. nobile alba (white). A trifling variety, with very pale edges to the sepals, petals, and tip of the lip. 1884.

D. n. Cooksonianum (Cookson's) *fl.*, middle area of the petals very deep purple, their tips with purple borders; bases of the petals hastate, thickened in the middle and velvety. 1885. A grand variety.

Dendrobium—*continued.*

D. n. elegans (elegant). *fl.* larger and more symmetrical than in the ordinary forms; petals broader, white at the base; zone surrounding the maroon disk of the lip pale sulphur-yellow, the apical margin rose-purple.

D. n. formosanum (Formosa). *fl.* white, the petals and lip tipped with mauve-purple; ovaries mauve. Formosa, 1883. One of the long-stemmed varieties.

D. n. pallidiflorum (pale-flowered). A synonym of *D. primulinum.*

D. n. Sanderianum (Sander's). *fl.*, sepals and petals purple, the latter white at base; disk of lip covered by a dark blotch, which is surrounded by rosy-purple, except a small white area in front, veined purple, and with a white border to the superior part. 1884.

D. n. Schneiderianum (Schneider's). A variety having a yellow hue over the lip, and a dark mauve-purple mark at its base. 1884.

D. n. Tollianum (Toll's). *fl.*, petals bordered with purple, and spotted and streaked with purple on the disk and at the base. 1884. A fine variety.

D. nycteridoglossum (dark-lipped). *fl.* produced in fascicles on the upper and ultimately leafless part of the stem; sepals and petals green, striped very dark red; lip green, with a dark spot on the disk, broad, triangular side lobes, and a very short, retuse central lobe. Papua, 1886.

D. Palpebræ (eyelids). *fl.* French white, with an orange-yellow disk near the base of the lip, faintly scented like Hawthorn; sepals oblong, narrower than the oval petals; lip oblong, with a short, convolute claw, downy above, and with a fringe of long hairs near the base; column yellowish; racemes loose, six to ten-flowered, produced from the joints immediately below the leaves. Late summer. *l.* oblong-lanceolate, acute. Stems clavate, four-angled, attenuated below, 7in. to 9in. long, with three to five leaves at their summit. Birma, 1849.

D. pardalinum (leopard-spotted). *fl.*, sepals and petals ochre, spotted dark purple; lip having a very long stalk, with two long, wavy, plicate keels, the front lobe pentagonal, both sides running backwards, producing a sagittate appearance. Stem climbing, covered with narrow, ligulate, one-leaved pseudo-bulbs. 1885.

D. Parthenium (Parthenium). *fl.* white, with a purple blotch at the base of the lip; sepals lanceolate-triangular, with obscure keels; petals oblong, obtuse, longer than the sepals; racemes two-flowered. *l.* 1½in. long. Stems thin. Borneo, 1885.

D. Paxtoni (Paxton's), of Lindley. A synonym of *D. chrysanthum.*

D. percnanthum (black-spotted-flowered). *fl.*, sepals and petals pale yellow, the former triangular, the chin blunt, the petals oblong, obtuse, longer than the sepals; lip white, ligulate, trifid at apex, the mid-lobe and borders of the upper part yellow, the side lobes blunt-rhomboid, the keels brown and purple; racemes numerous. Stems strong, shining. Moluccas, 1886.

D. Phalænopsis (Phalænopsis-like).* *fl.* about 2in. in diameter; perianth spreading; sepals pale pink, with reticulated nerves; petals rose-red, much larger, rhomboid-orbicular, acute; lip dark purplish-blood-red, the lateral lobes rounded, the middle one tongue-shaped; racemes pendulous, loosely six to ten-flowered. September. *l.* alternate, distichous, 6in. to 8in. long. Stems tufted, 1ft. to 1½ft. high. North Australia and New Guinea. (B. M. 6817; G. C. n. s., xxvi., p. 556; W. O. A. iv. 187.)

D. Pitcherianum (Pitcher's). *fl.*, sepals and petals pinkish-white, tipped purple, the petals having a broad, rosy mid-line from tip to base; lip light sulphur, with purple apex; disk with a callous, abrupt, whitish line in the middle, on either side of which are parallel, dark purple stripes. *l.* somewhat resembling those of *D. nobile* (which is supposed to be one of the parents of this hybrid, *D. primulinum* being believed to be the other).

D. pogoniates (bearded). *fl.* small; sepals and petals yellowish, the former lanceolate, acute, the latter cuneate-oblong; lip orange, with a long mid-lobe, bearded. *l.* linear-lanceolate. Stems fusiform, 1ft. high. North Borneo, 1886. A miniature plant, of more botanical than horticultural interest.

D. polycarpum (many-fruited). *fl.* yellowish, with purplish-red borders to the side laciniæ; sepals ligulate-triangular; petals longer, ligulate-spathulate; lip having roundish, angulate side laciniæ, and a rounded, triangular, undulated central one; racemes many-flowered, loose. Stems 3ft. long. Sunda Islands, 1883.

D. polyphlebium (many-veined). *fl.*, sepals and petals rosy; lip rounded, shorter than the sepals, a little fringed at the border, full of stiff hairs at the anterior border, purple-veined, with a light brownish-purple area. Pseudo-bulbs 1ft. to 1½ft. long. 1887. Probably a hybrid. (W. O. A. vii. 299.)

D. porphyrogastrum (purple-bellied). *fl.* 2in. to 3in. across; sepals and petals pale rosy-mauve, similar and sub-equal, the petals a little more deeply coloured than the sepals; lip pale rose-purple and white, with a deep purple, spotted disk, the margin ciliolate, the spur short and funnel-shaped. A hybrid between *D. Huttonii* and *D. Dalhousieanum.*

D. primulinum giganteum (gigantic). *fl.* white, tipped pink,

Dendrobium—*continued.*

with a sulphur lip, very large, freely produced. Sikkim. A fine variety. SYN. *D. cucullatum giganteum.*

D. profusum (profuse). *fl.*, sepals and petals yellowish-green, with fine purple at the base inside, and purple dots on the toothed petals, the sepals ligulate, acute; lip yellow, with a dark spot in the middle, the blade pandurate, the anterior part very broad, toothleted and wavy; peduncles seven to nine-flowered. *l.* deciduous. Philippine Islands, 1884.

D. purpureum (purple). *fl.* bright purple, about ⅔in. long, cylindrical, arranged in dense, spherical, sessile clusters, which are produced from the nodes of the old, leafless, spindle-shaped stems, of many years' duration, and usually 3ft. to 4ft. long; bracts cordate. Moluccas.

D. p. candidulum (whitish). *fl.*, tips of the sepals very bright green; ovary pure white, stalked. 1887.

D. p. Moseleyi (Moseley's). *fl.* white, tipped green, the tips of the sepals and petals less pointed than in the type; bracts ovate, acuminate. Stems 9in. (? or more) long. Arn Islands, 1884.

D. revolutum (revolute). *fl.* solitary, axillary, ⅔in. long; sepals and petals white, reflexed upwards, lanceolate, acute, nearly equal; lip bright yellow-green, nearly quadrate, convex; disk with three furrows and red bands; bracts caducous. July. *l.* numerous, distichous, 1in. to 2in. long, oblong or linear- or ovate-oblong, obtuse or retuse, half-amplexicaul. Stems tufted, 1ft. long. Pseudo-bulbs none. Malay Peninsula, 1882. This species is not very handsome (B. M. 6705.)

D. rhodopterygium Emerici (Emeric's). "A white line runs outside the mid-vein of the lateral sepals. The dark transverse blotch on the anterior area of the lip is interrupted by an amethyst-colour bar. The anterior, apiculate border is pure white, changing then to straw-colour." Reichenbach, from whose description above is copied, placed this plant as a variety under *D. polyphlebium.*

D. rhombeum (rhomboid). A synonym of *D. aureum.*

D. Rimanni (Rimann's). *fl.* equalling those of a good *D. speciosum*, disposed in terminal, somewhat zigzag racemes; sepals and petals yellow, the former striped purple outside; lip white, with purple reticulations. *l.* oblong, 3½in. long, very coriaceous. Stems cylindric-fusiform, leafy above. Moluccas, 1883. A stately species.

D. rutriferum (shovel-bearing). *fl.*, sepals rose, triangular, blunt, the lateral ones extended into a long pouch; petals rose at the base, whitish at the blunt end; lip ligulate-pandurate, with inflexed borders, thus saccate at apex, where the borders are denticulate; rachis rather short, covered with a capitate-umbellate inflorescence. Stem furrowed, as thick as a goose quill. Papua, 1887. (L. iii. 119.)

D. Schneiderianum (Schneider's). *fl.* scented, the sepals and the broader petals white, tinged lilac-purple in the upper half; lip orange, with an area of light velvet at base, wherefrom dark reddish lines emanate, a whitish area round this is washed with light sulphur, the apex of the lip lilac-purple. Pseudo-bulbs 6in. high, 2in. thick, three-leaved. 1887. A hybrid between *D. Findlayanum* and *D. aureum.*

D. Schrœderi (Baron von Schrœder's). A synonym of *D. densiflorum.*

D. secundum niveum (snowy). *fl.* white, with the exception of an orange tip to the lip. Stem shorter than in the common form.

D. signatum (preserved). *fl.*, chin very blunt-angled; sepals sulphur, ligulate, acute, reflexed; petals white to lightest ochre, broader, acute, reflexed; lip shouldered at base, nearly square and narrow, suddenly enlarged, the disk marked with a blotch and four lines of brown; column light green, with some mauve lines; inflorescence one-flowered. Siam, 1884.

D. speciosum Bancroftianum (Bancroft's). *fl.*, petals longer and narrower than in the type; lip paler, with a few purple spots at base. Stems slenderer.

D. splendidissimum grandiflorum (large-flowered). *fl.*, sepals and petals rose-purple at the tips, white at base; lip with a large, purple blotch and a pale yellow zone. 1887. (M. O. iii., p. 91.)

D. Stratiotes (soldier).* *fl.* of a good size, very peculiar; sepals ivory-white, lanceolate, acuminate, rolled back; petals pale green, longer than the sepals, narrow-linear, twisted, quite erect; lip cream-coloured, veined violet, three-lobed, the front lobe ovate, acute; racemes numerous. *l.* rather short, oblong. Pseudo-bulbs long, fusiform. Sunda Islands, 1886. A remarkable and handsome species. (G. C. n. s., xxvi., p. 177; I. H. 602.)

D. strebloceras (twisted-horned). *fl.*, sepals green, nerved brown on the inner side at base, ligulate, acute, twisted, undulated; petals dark cinnamon-brown, margined green, longer, linear, acute, twisted four times; lip green, brown, white, and mauve-purple,

Dendrobium—*continued.*

the side laciniæ oblique, oblong, truncate; column white, minutely spotted brown; inflorescence eight-flowered. 1887.

D. s. Rossianum (Ross'). *fl.* white; petals greenish; lip and sepals at length yellowish. 1888.

D. sulcatum polyanthum (many-flowered). *fl.* buff-yellow, the lip orange, with two crimson blotches; raceme sub-globose, about fourteen-flowered; peduncle erect from an upper axil, then arching over. *l.* ovate-oblong, acute or shortly acuminate, seven-nerved, sub-cordate at base, 3in. to 4¼in. long. 1887.

D. superbum Burkei (Burke's). *fl.* white, with two light blush-rose cheeks on the base of the disk of the yellowish-white lip. 1884. A fine variety.

D. tetragonum (quadrangular). *fl.* 3in. to 4in. across; sepals yellow, spotted red, the dorsal one narrow-subulate, the lateral ones lanceolate, much broader at the base than the dorsal one; petals white, streaked red, linear, shorter and narrower than the sepals; lip white, transversely barred red, broadly ovate, apiculate, obscurely three-lobed, with two white lamellæ between the side lobes; raceme few-flowered. *l.* in pairs at the summit of the stem, spreading, oblong or elliptic-lanceolate. Stems pendulous, acutely four-angled, 8in. to 15in. or more in length, attenuated to a slender footstalk which is pseudo-bulbous at base. Australia. (B. M. 5956.)

FIG. 15. DENDROBIUM THYRSIFLORUM, showing Habit and detached Flower.

D. thyrsiflorum (thyrse-flowered). The correct name of the plant described on p. 453, Vol. I., as *D. densiflorum albo-luteum.* See Fig. 15.

D. t. Walkerianum (Walker's). *fl.* larger, racemes stronger, and stems longer, than in the type. (W. S. O. iii. 21.)

D. Treacherianum (Treacher's). *fl.* pale rose-red, two or three to a scape, sub-erect, upwards of 1½in. long; sepals narrow-lanceolate, the dorsal one straight, the lateral ones connate in a gibbosity or spur striped with red; petals like the dorsal sepal; lip darker red and shorter than the petals, three-lobed. July. *l.* in pairs, 3in. to 4in. long, ½in. to ⅔in. broad, linear-oblong. Pseudo-bulbs brownish-green, stained red. Borneo, 1880. (B. M. 6691; W. O. A. vi. 288.)

D. trigonopus (triangular-columned). *fl.* golden-yellow; sepals ligulate, acuminate, keeled on the middle; petals broader and shorter; claw of the lip rather long, dilated into a broad lamina whose lateral segments are nearly square; column triangular-pandurate. *l.* thick, papery, dull green, rather rough, slightly hirsute at back. Birma, 1887.

D. Vannerianum (Vanner's). *fl.*, sepals white, margined purple, lanceolate; petals white, purple at apex, oblong, acuminate; lip white, marked purple, rhombic, the disk sulphur-coloured. *l.* lanceolate, more than 2in. long, ½in. wide. 1887. A hybrid between *D. japonicum* and *D. Falconeri.*

D. Veitchianum (Veitch's). A synonym of *D. macrophyllum.*

D. vexabile (vexing). *fl.* light sulphur-ochre, partly white;

Dendrobium—*continued.*

side laciniæ of the lip marked with numerous narrow lines, the anterior lacinia sulphur, with an orange blotch on each side of the tuft of hairs, very wavy. 1878. Allied to *D. Ruckeri.*

D. virgineum (maiden). This resembles *D. infundibulum*, but the flowers are smaller, ivory-white, with two thickened, ligulate, reddish lines running from the base to the middle of the lip. Birma, 1885.

D. Wallichianum (Wallich's). A variety of *D. nobile.*

FIG. 16. DENDROBIUM WARDIANUM.

D. Wardianum assamicum (Assam). *fl.* smaller but more brilliantly coloured than in the type. *l.* narrower. Stems shorter and slenderer. (B. M. 5058, under name of *D. Falconeri* var.). The type is illustrated at Fig. 16.

D. W. giganteum (gigantic).* *fl.* larger and stouter than those of the type. Winter and spring. *h.* sometimes 5ft. Birma. A grand variety. (W. O. A. iii. 113; F. M. ser. ii. 212.)

D. Williamsianum (Williams').* *fl.* large; sepals ivory-white, the dorsal one and the ivory-white petals broadly oblong, apiculate, the lateral sepals triangular, the disk of the petals washed light purple; lip purple, having an angular chin, standing upright, adpressed to the column, the limb roundish; racemes about twelve-flowered, produced from the upper part of the slender bulbs. New Guinea, 1886. (G. C. n. s., xxvi., p. 173; W. O. A. 252.)

DENDROCHILUM CUCUMERINUM. A synonym of **Platyclinis cucumerina** (which *see*).

DEYEUXIA (named in honour of Nicholas Deyeux, 1753-1837, a French chemist). SYN. *Lachnagrostis.* ORD. *Gramineæ.* A genus embracing nearly 120 species of greenhouse or hardy, mostly perennial Grasses, broadly dispersed over the temperate and mountainous regions of the globe. Spikelets one-flowered, variously paniculate; glumes three, the two inferior ones empty; stamens three; panicles terminal. Leaves usually flat. *D. elegans variegata* is the only plant of the genus yet introduced which is deserving of mention here; it thrives under ordinary treatment. The genus is represented in the British Flora by *D. neglecta*, a rare species.

D. elegans variegata (elegantly variegated). *l.* numerous, linear, 1ft. to 1½ft. long, of a deep, bright green, bordered with creamy-yellow. Rootstock thick. New South Wales, 1884. An elegant, greenhouse, foliage plant.

DIACRIUM (from *dia*, through, and *akris*, a point; in allusion to the sheaths on the stalk). ORD. *Orchideæ.* Of this genus four species have been described: they are

Diacrium—*continued.*

stove, epiphytal Orchids, natives of Mexico, Central America, and Guiana. Flowers showy, loosely racemose, shortly pedicellate; sepals sub-equal, free, spreading, rather thick, petaloid; petals somewhat similar; lip spreading from the base of the column, nearly equalling the sepals, the lateral lobes spreading or reflexed, the disk elevated between the lateral lobes, two-horned above; column short and broad, slightly incurved; pollen masses four; peduncle terminal, simple, with paleaceous sheaths. Leaves few, articulated with the short sheaths. Stem fleshy, scarcely thickened into an elongated pseudobulb. Only one species calls for mention. For its successful cultivation, it requires a light situation in a very moist stove.

D. bicornutum (two-horned). The correct name of the plant described on p. 512, Vol. I., as *Epidendrum bicornutum.*

DIANTHERA. Of the eighty species included in this genus, two or three are natives of tropical Africa or Asia, and the rest are all tropical or extra-tropical American. To those described on p. 461, Vol. I., the following should now be added:

D. bullata (studded). *fl.* whitish, small, fascicled in the axils of the minute, opposite bracts. *l.* opposite, shortly petiolate, 3½in. to 4½in. long, 2½in. to 2¾in. broad, elliptic, obtusely acuminate, slightly contracted at base, cordate, bullate between the veins, glabrous, dark green above, purple and pubescent on the veins beneath. Stem terete, fuscous-purple. Borneo, 1886. Stove. (I. H. 1885, 589.)

DIANTHUS. To the species described on pp. 461-4, Vol. I., the following should now be added:

D. cinnabarinus (cinnabar-red). *fl.* petals fiery-red above, paler beneath, covered with sessile glands; stamens not exserted. Summer. *l.* narrow-linear, with very acute, rigid tips. Thessaly, 1888. A fine species, suffrutescent at the base.

D. superbus nanus (dwarf). A dwarf variety, growing only 6in. in height, and covered with rosy-purple, deeply-fringed flowers.

D. sylvestris (wood-loving). The correct name of the plant described on p. 464, Vol. I., as *D. virgineus.*

DICHÆA. About a dozen species are included in this genus. To that described on p. 465, Vol. I., the following should now be added:

D. vaginata (sheathed). *fl.* white, very small. Stems long and flattened, with close-set, distichous, small-sized leaves. Mexico, 1885. A neat plant, suitable for basket culture.

DICHOPOGON (from *dicha*, double, and *pogon*, a beard; in allusion to the two appendages of the anthers). ORD. *Liliaceæ.* A small genus (two species) of greenhouse, perennial herbs, natives of Australia and Tasmania. Flowers loosely racemose, solitary or fascicled in the scarious bracts; perianth marcescent, persistent, not twisted, the segments distinct, spreading, the inner ones broader; stamens six, hypogynous; pedicels slender, often jointed above the middle; scape often branched, leafless, or furnished with leafy bracts below the inflorescence. Leaves radical, narrow-linear. Rhizome short; root-fibres fascicled, often bearing tubers. *D. strictus*, the only species as yet in cultivation, thrives in a compost of sandy loam and peat, and may be increased by divisions of the rhizome, or by the tubers on the root-fibres.

D. strictus (straight). *fl.*, perianth pale or dark purple, 1½in. or less in diameter, the segments horizontally spreading, the outer ones elliptic-oblong, acute, the inner twice as broad; raceme or panicle 3in. to 8in. long. November. *l.* 1½ft. long, ½in. broad, concave, Grass-like, sheathing at the very base. Stem longer than the leaves, erect, stout or slender. Tubers ½in. to ¾in. long, fleshy. 1883. (B. M. 6746.)

DICKSONIA. About forty species are here included. To those described on pp. 467-8, Vol. I., the following should now be added:

D. davallioides Youngii (Young's). *fronds* large, minutely sub-divided. See Fig. 17, for which we are indebted to Messrs. W and J. Birkenhead.

D. Lathami (Latham's). *fronds* tripinnate, narrow-oblong, dark

Dicksonia —*continued.*

green, coriaceous, 14ft. to 15ft. long; pinnæ sessile, oblong-lanceolate, acuminate, 1½ft. to 2ft. long, 6in. to 8in. broad, with close-set, sessile, lanceolate, acute pinnules; pinnulets oblong-obtuse, more or less lobed or crenulate. 1886. A noble, stove, evergreen, Tree Fern, supposed to be a hybrid between *D. antarctica* and *D. arborescens.*

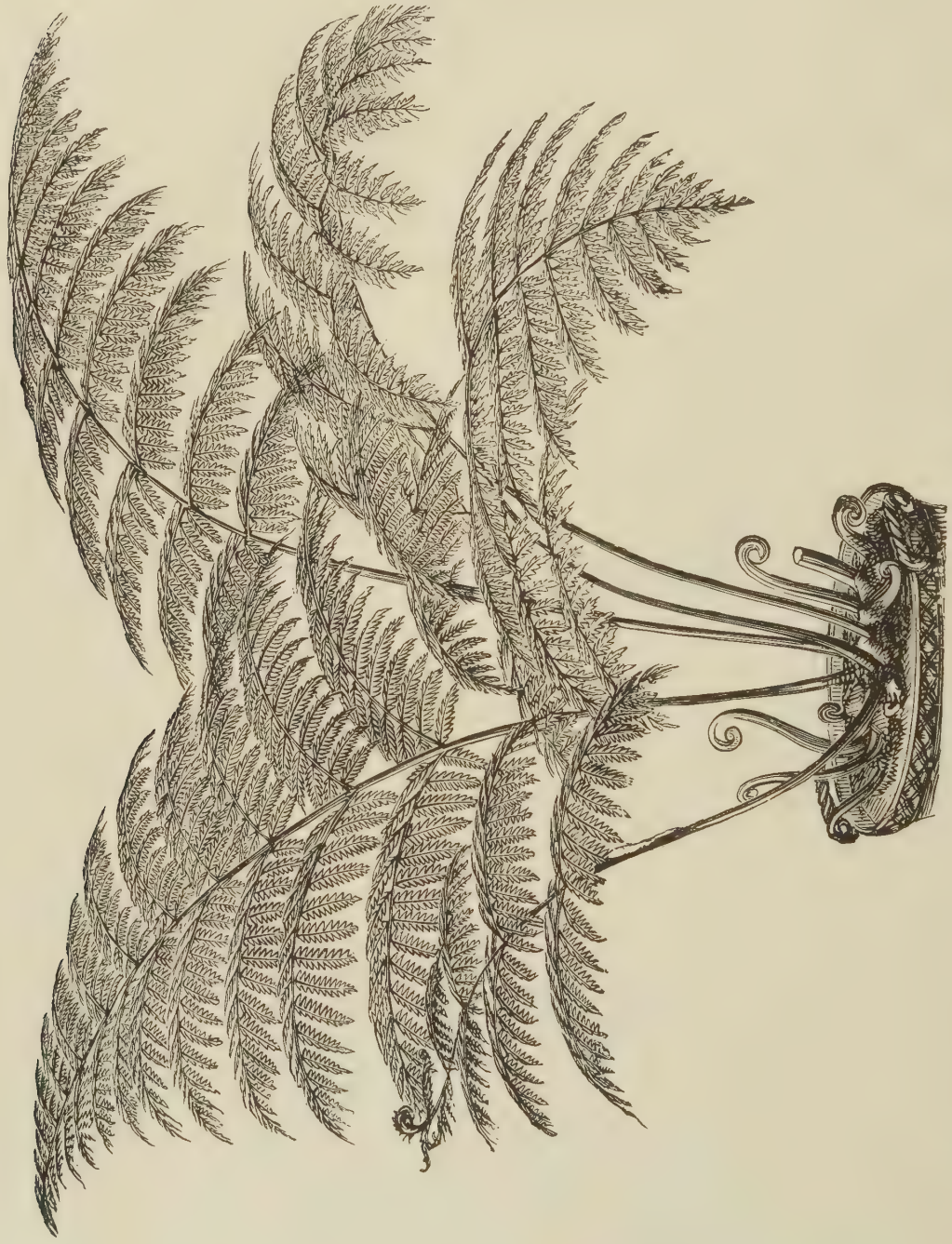

FIG. 17. DICKSONIA DAVALLIOIDES YOUNGII.

DIEFFENBACHIA. According to Bentham and Hooker, there are only about half-a-dozen true species of this genus, all natives of tropical America. To the species and garden forms described on pp. 472-5, Vol. I., the following should now be added:

D. Jenmani (Jenman's). *l.* long and narrow, oblong-lanceolate, pea-green, with oblique, elongated blotches parallel with the primary veins, extending from the centre nearly to the margin, and mingled with smaller blotches over the surface. British Guiana, 1884. (R. G. 1884, 365.)

DIMORPHANTHUS. To the species described on p. 477, Vol. I., the following variety should now be added:

D. mandschuricus foliis-variegatis (variegated-leaved). *l.* green in the middle, the margins white. 1886. A handsome variety. (I. H. 1886, 609.)

DIMORPHOTHECA. To the species described on pp. 477-8, Vol. I., the following should now be added:

D. fruticosa (shrubby). *fl.-heads* 1½in. in diameter, pedunculate; ray florets whitish above and brownish beneath. Summer. *l.* obovate. Stems procumbent. 1887. Perennial.

DIOSCOREA. According to herbarium specimens, there are 150 known species of this genus, distributed over the whole area of the natural order. To those described on p. 478, Vol. I., the following should now be added:

D. crinita (hairy). *fl.* white; racemes very numerous, pendulous, solitary or several in the axils, 2in. to 3½in. long, forming a panicle at the ends of the branches. September. *l.* long-petiolate; leaflets five, 2in. to 3in. long, petiolulate, elliptic-lanceolate or oblanceolate, obtuse, acute or acuminate, with a long, bristly mucro. Natal, 1884. A slender, graceful, pubescent climber, forming an elegant pot plant when trained on a balloon trellis. (B. M. 6804.)

D. hybrida (hybrid). *fl.* greenish-yellow, in numerous axillary clusters. *l.* sub-cordate, attenuated. Tuber large, flat. 1883. This half-hardy twiner is supposed to be a hybrid between *D. Batatas* and *Tamus communis*. (R. H. 1882, p. 379.)

D. pyrenaica (Pyrenean). *fl.* solitary, rather remote, shortly pedicellate; perianth turbinate-campanulate, with oblong segments; male racemes axillary, twin or ternate, simple and rarely somewhat branched. July and August. *l.* sparse, deeply cordate-ovate, acute, mucronate. Stems one to four, slender, flexuous, branched. Underground caudex tuberous, about the size of a nut. *h.* about 3in. Pyrenees. Plant herbaceous, glabrous.

DIOSPYROS. To the species described on p. 479, Vol. I., the following species and varieties should now be added:

D. Aurantium (orange). A variety of *D. Kaki*.

D. Berti (Bert's). A variety of *D. Kaki*.

D. coronaria (crowned). *fl.*, calyx spreading or slightly reflexed in fruit. *fr.* orange-red, sub-globose, 1in. in diameter. *l.* large, coriaceous. Japan, 1885. A small, hardy tree.

D. elliptica (elliptic). A variety of *D. Kaki*.

D. Kaki Aurantium (orange). *fr.* light orange-yellow, apple-shaped, depressed; calyx very large, with large, rhomboidal, jagged segments. (R. H. 1887, p. 349, f. 2.)

D. K. Berti (Bert's). *fr.* beautiful reddish-orange-yellow, depressed apple-shaped, large, smooth; basilar cavity broad and deep; summit umbilicate, with a narrow cavity. (R. H. 1887, p. 349, f. 3.)

D. K. elliptica (elliptic). *fr.* beautiful, shining orange-yellow, regularly elliptical, very smooth; basilar cavity very small; apical mucro scarcely visible. (R. H. 1887, p. 349, f. 4.)

D. Sahuti gallica (Sahut's, French). *fr.* reddish-yellow and golden, covered with a silvery bloom, apple-shaped, acuminate at summit; surface smooth and rounded; basilar cavity almost absent; umbilical cavity absent and replaced by a slight, characteristic, angular elevation. (R. H. 1887, p. 349, f. 5.)

D. Wiseneri (Wisener's). *fl.*, calyx lobes having a short, central lobe. *fr.* egg-shaped, obscurely ribbed. *l.* elongate-ovate, shortly attenuated and rounded at apex. Japan, 1887. Hardy. Probably a variety of *D. Kaki*.

DISA. To the species described on pp. 483-4, Vol. I., the following should now be added:

D. atropurpurea (dark-purple). *fl.* rich purplish-lake, solitary, on slender peduncles 3in. to 4in. high; dorsal sepal hooded, with a very short, knob-like spur, the lateral ones elliptic-lanceolate, acute; petals auriculed at base, bifid at apex; lip with a distinct stalk ¼in. long, and a cordate, acuminate, wavy-margined blade, having two or three teeth on each side. *l.* linear, Grass-like. South Africa, 1885. A beautiful little plant. (B. M. 6891.)

D. racemosa (racemose). *fl.* light purple, marked white, dark purple, and green; middle sepal rhombic, the lateral ones oblong; petals cuneate-triangular, serrated on the upper margin, with

Disa—*continued.*

inflexed apex; lip rhombic-lanceolate, narrow, small; inflorescence one-sided, about six-flowered. 1887. (B. M. 7021.) SYN. *D. secunda*.

D. secunda (side-flowering). A synonym of *D. racemosa*.

DISCANTHUS. A synonym of **Cyclanthus** (which *see*).

DISPORUM. To the species described on pp. 484-5, Vol. I., the following should now be added:

D. Leschenaultianum (Leschenault's). *fl.* white, ¼in. to ¾in. in diameter, sub-campanulate, two to five together in the uppermost axils; segments oblong or linear-oblong. Spring. *l.* rather rigid, 1in. to 4in. long, 1in. to 2in. broad, narrowed to distinct petioles, varying from elliptic-lanceolate to almost orbicular, cuspidate, acute, acuminate, or almost caudate. *h.* 1ft. to 2ft. Mountains of South India and Ceylon. (B. M. 6935.)

DODECATHEON. To the species described on pp. 485-6, Vol. I., the following should now be added:

D. Meadia splendidum (splendid). *fl.* deep crimson, with a yellow ring at the orifice of the reflexed corolla; scape four to ten-flowered. Spring.

DOLICHODERIA TUBIFLORA. A synonym of **Achimenes tubiflora** (which *see*).

DOODIA. The five species included in this genus are confined to the islands from Ceylon eastward to Fiji, New Zealand, and Australia. To those described on p. 486, Vol. I., the following varieties should now be added:

D. aspera multifida (many-cleft). *fronds* arched, with a dense tassel at the apex; when young, tinted pink. Dwarf evergreen.

D. Harryana (Harry Veitch's). This differs from *D. caudata* (of which it is apparently a form) in being stouter, of firmer texture, and larger. 1884. Garden variety.

DOUGLASIA. One species of this genus is a native of Central Europe; the rest are North American. Flowers axillary or terminating the branchlets, solitary and sessile or pedicellate, sometimes fascicled or umbellate; calyx five-cleft to the middle; corolla salver-shaped, the limb of five imbricated lobes. Leaves imbricated or clustered and spreading, entire. To the species described on p. 488, Vol. I., the following should now be added:

D. lævigata (smooth).* *fl.* rose-pink, pedicellate, ¼in. in diameter; corolla tube twice as long as the calyx, the lobes very broadly obovate; involucral bracts four to six, ¼in. long; peduncle about 1in. long, erect, two to five-flowered. Spring and autumn. *l.* rosulate, ¼in. to ¾in. long, linear or oblong-lanceolate, acute or sub-acute. Alps of Oregon, 1886. Plant tufted. (B. M. 6996.)

DRACÆNA. To the species described on pp. 490-1, Vol. I., the following should now be added:

D. floribunda (abundant-flowered). *fl.* greenish, cylindrical, above ¼in. long; panicle drooping, shortly pedunculate, 3ft. to 4ft. long, made up of fifteen to twenty drooping racemes 1ft. or more long. *l.* fifty to sixty, crowded in a dense rosette, lorate, acuminate, 3ft. to 4ft. long, 3in. to 3½in. broad. Trunk 6ft. to 8ft. high. Native country unknown. (B. M. 6447.)

D. fragrans variegata (variegated). *l.* recurved, deep green, with a broad, central, striped variegation of yellow and pale yellowish-green. 1887. SYN. *D. Lindeni*.

D. Lindeni (Linden's). A synonym of *D. fragrans variegata*.

D. Massangeana (Massange's). *l.* broadly lanceolate, acuminate, dark green, with a median, whitish stripe. 1883. A variety of *D. fragrans*, closely resembling *D. f. variegata*. (B. H. 1881, 16.)

D. sepiaria (hedge-loving). *fl.* pure white, in large panicles. *fr.* yellow, persistent for a long time. *l.* upright, small, dark green, tufted. Fiji, 1887. An ornamental perennial.

DRACOCEPHALUM. To the species described on p. 491, Vol. I., the following should now be added:

D. imberbe (beardless). *fl.*, corolla lilac-blue, 1in. long, the lips nearly equal; bracts cuneate, cut, glabrous. *l.*, radical ones long-petiolate, cauline ones few, shortly petiolate, all reniform, deeply crenate. Floriferous branches erect. *h.* 6in. Siberia, 1883. (R. G. 1080, f. 4-5.)

DRACONTIUM. About half-a-dozen species, all tropical American, are here included. To those described on pp. 491-2, Vol. I., the following should now be added:

D. fœcundum (fertile). *fl.*, spathe dull brown outside, dark vinous-purple within, 5in. high, erect, narrowly cylindric-oblong; spadix bluish-brown, 1¾in. high, sub-sessile, erect, cylindric, obtuse. March. *l.* solitary, produced after the flower, 4ft. to 5ft. in diameter, horizontal, tripartite, each segment bearing several pairs of drooping leaflets; petiole 6ft. high. Tubers surrounded by a profusion of acute bulbils, rising above the ground. British Guiana, 1880. (B. M. 6808.)

DUVALIA. There are about ten species of this genus. To those described on p 496, Vol. I., the following should now be added:

D. angustiloba (narrow-lobed). *fl.*, corolla chocolate-brown, ⅜in to 1in. in diameter, the lobes narrow-lanceolate, acuminate, folded back into thin, vertical plates; corona white; cymes stout, five to twenty or more-flowered Stems subglobose or oblong, ½in. to 1in. long, ½in to ¾in. thick, obtusely four or rarely five-angled. 1875.

DYCKIA. Flowers spicate; sepals free, ovate, imbricated; petals longer, narrowed at base, convolute-imbricated, at length spreading; stamens free, or shortly connate at base with the petals. Leaves densely rosulate, rather thick, spinulose-serrated. To the species described on p. 497, Vol. I., the following should now be added:

D. leptostachya (slender-spiked). *fl.* twenty to twenty-five, in a simple, erect spike 6in. to 9in. long; sepals reddish, densely pruinose; corolla bright scarlet, ⅜in. long, the petals ⅛in. broad; peduncle slender, 3ft. long. Summer. *l.* fifteen to eighteen in a dense, nearly sessile rosette, lanceolate, acuminate, falcate, rigid, 1½ft. to 1¾ft. long, 1in. to 1¼in. broad, semicircular at back, the marginal prickles brown. Paraguay. 1867.

DYSSOCHROMA (from *dysoos*, sickly, and *chroma*, colour; in allusion to the lurid, sickly colour of the flowers). ORD. *Solanaceæ*. A small genus (two species) of stove, climbing sub-shrubs or small trees, natives of Brazil. Flowers greenish-yellow, large, pendulous; calyx ample, five-cleft; corolla funnel-shaped, swollen or campanulate above, the limb plicate, deeply five-lobed; stamens five; pedicels often solitary, terminating the short, nodose branchlets. Leaves entire, membranous or coriaceous. For culture, *see* **Solandra,** on p. 452, Vol. III.

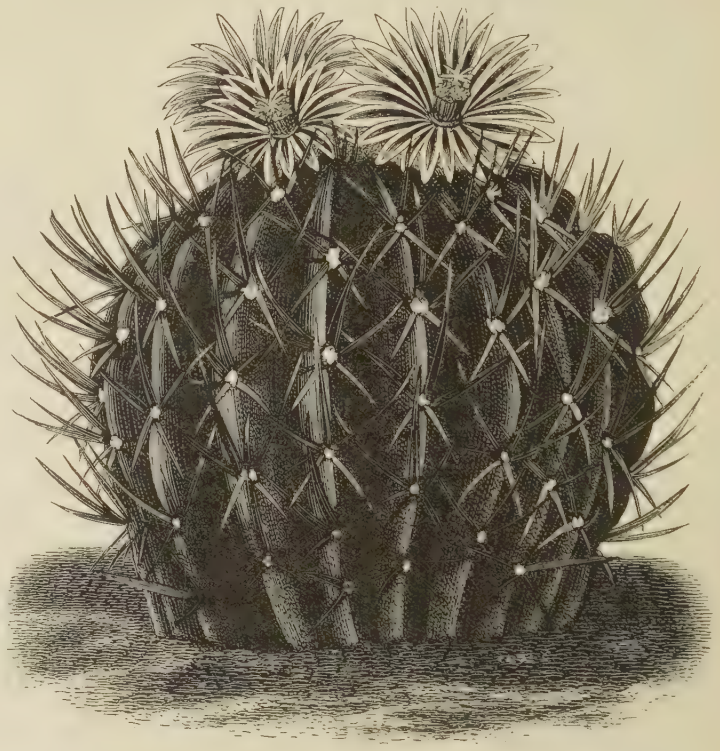

FIG. 18. ECHINOCACTUS COPTONOGONUS.

FIG. 19. UPPER PORTION OF PLANT OF ECHINOCACTUS CORNIGERUS.

Dyssochroma—*continued.*

D. eximia (choice). The correct name of the plant described on p. 209, Vol. II., as *Juanulloa eximia*.

D. viridiflora (green-flowered). The correct name of the plant described on p. 452, Vol. III., as *Solandra viridiflora*.

ECHINOCACTUS. To the species described on pp. 499-501, Vol. I., the following should now be added:

E. coptonogonus (wavy-ribbed). *fl.* 2in. across, Daisy-like, with a very short tube; sepals and petals white, with a purple, central stripe; stamens red, with yellow anthers. April and May. Stem globose, depressed at top; ribs ten to fourteen, strong, sharp-edged, wavy, with spine tufts set in little depressions along the margins; spines five to a tuft, the two upper ones 1in. long, quadrangular, the two lower ones shorter, flattened, the central one longest. Mexico. See Fig. 18. SYN. *E. interruptus.*

E. cornigerus (horn-bearing). *fl.* small; sepals brownish-red; petals purple, narrow. Stem spherical, greyish-green; ribs fourteen to twenty-one, stout, wavy; spines in tufts about 2in. apart, stouter than in any other species, the three erect, horn-like ones yellow, the broad, tongue-like one purple, very strong. Mexico and Guatemala. Probably not yet cultivated in England. See Fig. 19. SYNS. *E. latispinus, Melocactus latispinus.*

FIG. 20. PORTION OF RIB, WITH FLOWER AND BUNDLE OF SPINES, OF ECHINOCACTUS EMEROYI.

E. Emeroyi (Emeroy's). *fl.* 3in. long; petals red, with yellowish margins, spreading; stamens deep yellow; tube clothed with kidney-shaped scales or sepals. Autumn. Stem globose, 1ft. to 2ft. in diameter; ribs about thirteen, with large, rounded tubercles; spines in star-shaped bundles of eight or nine at the apices of the tubercles, angled, articulated, 1in. to 4in. long, with hooked points. Lower Colorado and California. See Fig. 20.

E. equitans (equitant). A synonym of *E. horizonthalonis.*

E. Haselbergii (Haselberg's). *fl.* ochreous-yellow and red, 1in. to 1½in. in diameter, sessile, broadly campanulate, with a short, red, spiny tube; segments about forty. April. Stem globose or oblate, 3in. in diameter; tubercles small, convex, appearing almost vertically disposed in innumerable parallel series, but really spirally arranged, convex, crowned with a tuft of white hairs; spines twenty to a tuft, silvery, acicular, ½in. long, stellately spreading. Native country unknown. (B. M. 7009.)

E. horizontalis (horizontal). A synonym of *E. horizonthalonis.*

E. horizonthalonis (spreading-spined). *fl.* terminal, 4in. across, scented, cup-shaped, springing from the young spine

Echinocactus—*continued.*

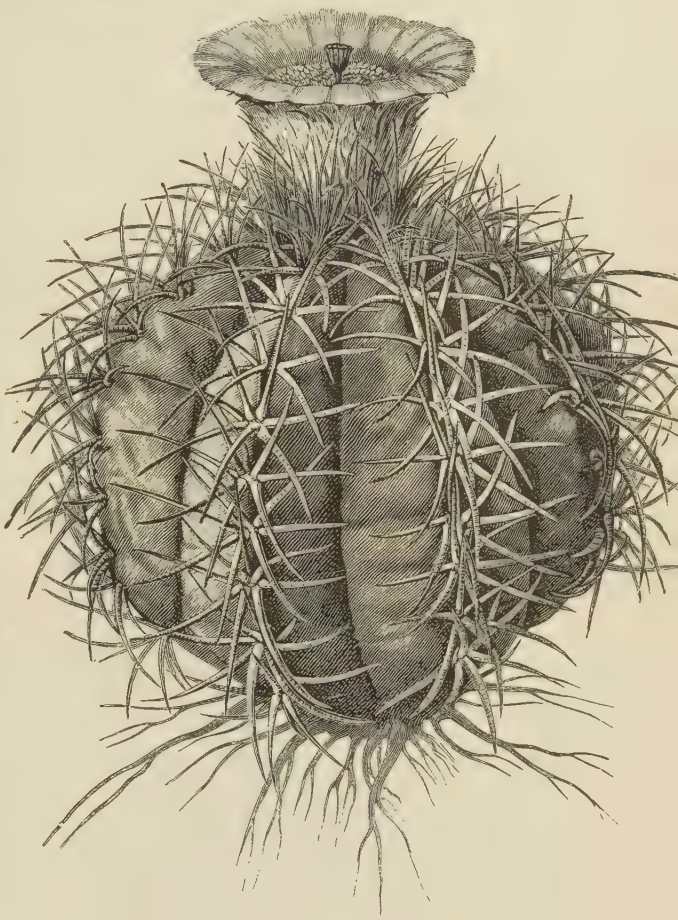

FIG. 21. ECHINOCACTUS HORIZONTHALONIS.

tufts; petals in two rows, deep rose, paler on the inside; stamens with white filaments and yellow anthers. May and June. Stem globose, usually flattened at top; ribs or ridges eight or nine, large, greyish-green; spines in crowded, star-like clusters along the edges of the ribs, strong, slightly curved, horn-like, marked with numerous rings. Mexico. See Fig. 21. SYNS. *E. equitans, E. horizontalis.*

E. interruptus (interrupted). A synonym of *E. coptonogonus.*

E. Joadii (Joad's). *fl.* bright yellow, handsome, 2in. in diameter; calyx tube furnished with tufts of slender spines, mixed with curly hairs; petals numerous, narrow-oblong, acute; stigmas crimson. Stem globose, many-ribbed; spines brownish, the outer ones fifteen to eighteen, radiating, the inner ones six or seven, longer and stouter, directed outwards. Uruguay (?), 1885. (B. M. 6867.)

E. Johnsoni (Johnson's). *fl.* purple or pink, 2in. to 2¾in. long and wide, with numerous reniform sepals on the ovary and tube; petals ovate, obtuse. Stem medium-sized, 4in. to 6in. high, with seventeen to twenty-one low, rounded, interrupted, close-set, often oblique ribs, densely covered with stoutish, reddish-grey spines, the outer ten to fourteen ¼in. to 1¼in. long, the upper longest; the central four stouter, recurved, 1½in. long. Southern Utah. (R. G. 1883, p. 58.)

E. latispinus (broad-spined). A synonym of *E. cornigerus.*

E. polycephalus (many-headed). *fl.* enveloped at base in a dense mass of white wool, which hides the tube; petals bright yellow, 1in. long, spreading like a saucer; stamens yellow, numerous. Spring. Stems numerous in old plants, the largest 1½ft. to 2½ft. high, cylindrical, globose when young; ribs twelve to twenty, sharply defined; spines in clusters 1in. apart, reddish, broad, flattened on the upper side, annulated, the central ones

Echinocactus—*continued.*

FIG. 22. PORTION OF RIDGE, WITH SPINES, OF ECHINOCACTUS POLYCEPHALUS.

over 3in. long in old plants, and sometimes curved. California and Colorado, 1886. Warm house. See Fig. 22.

E. Pottsii (Potts'). *fl.* yellow, about 2in. across, short-tubed, several expanding together on the top of the stem. Summer. Stem globular, 1½ft. in diameter; ridges about a dozen, rounded and even, with acute sinuses; spines lin. long, bristle-like, arranged in clusters of seven or nine, with a cushion of white wool at the base. California, 1840. Warm house. See Fig. 23.

E. Scopa cristatus (crested). A curious monstrosity, owing its origin to fasciation, such as occurs in the Cockscombs, Echeverias, &c. The plant shown at Fig. 24 is grafted on the stem of a Cereus.

E. senilis (old). *fl.* light pink, 1½in. long, 1in. in diameter, having a scaly, cylindrical tube. Stem stout, cylindric, with sixteen or eighteen ribs, having tufts of numerous hair-like spines, curving upwards. Chili, 1886. (R. G. 1230 A.)

E. Wislizeni (Wislizen's). *fl.* greenish-yellow, about 2in. long and broad, developed only on large plants. Summer and autumn. Stem depressed when young, large and cylindrical when old; ridges about a score, regular and sharp-edged, bearing bundles

Echinocactus—*continued.*

FIG. 23. ECHINOCACTUS POTTSII.

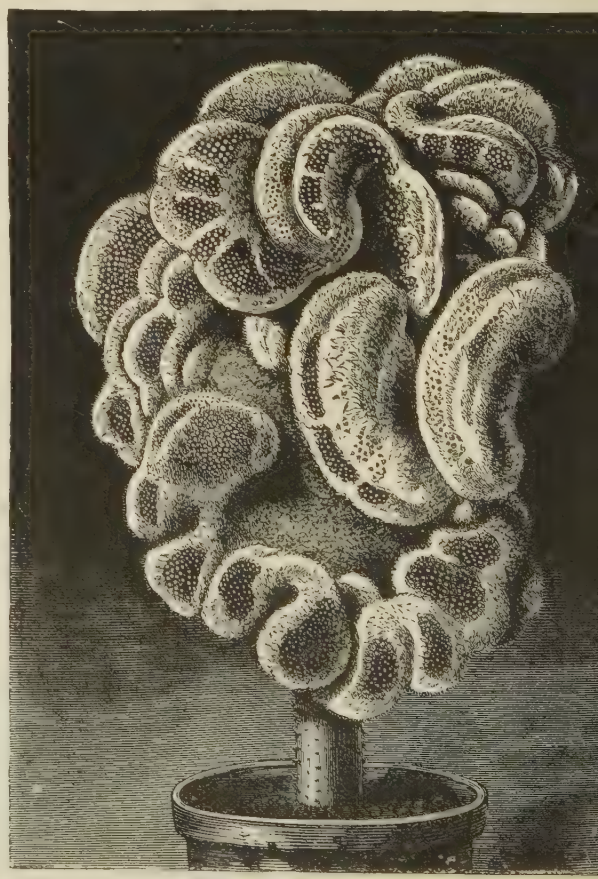

FIG. 24. ECHINOCACTUS SCOPA CRISTATUS

Echinocactus—*continued.*

of spines at regular intervals, the outer and shorter ones being white and spreading, while from the middle of each tuft arise three 2in. long and one 3in. long, with the point hooked, and as strong as steel. See Fig. 25.

FIG. 25. PORTION OF RIDGE, WITH SPINES AND FLOWER, OF ECHINOCACTUS WISLIZENI.

ECHINOPSIS. To the species described on pp. 502-3, Vol. I., the following variety should now be added:

E. Eyriesii flore-pleno (double-flowered). A form with several rows of petals, which impart a double appearance to the flowers. See Fig. 26

ENCELIA (from *egchelion*, a little eel; in allusion to the appearance of the seeds). SYN. *Pallasia* (of L'Héritier). ORD. *Compositæ*. A genus embracing about a score species of branched, villous, pubescent, or tomentose herbs, sometimes shrubby at the base, natives of Mexico or Western America, from Chili to California. Flower-heads yellow, violet, or purplish, radiate, mediocre or rather large, long-pedunculate at the tips of the branches, rarely smaller and irregularly panicled; involucral bracts in two or three series; ray florets spreading, entire or shortly toothed. Leaves opposite, or the upper ones rarely nearly all alternate, entire, toothed, or lobed. *E. canescens*, the only species calling for mention here, is a pretty, dwarf, greenhouse sub-shrub, thriving in loamy soil. Cuttings, inserted under a glass, will strike readily, if not over-watered.

E. canescens (hoary). *fl.-heads* orange; involucral scales villous, ciliated. July. *l.* broadly ovate, entire, obtuse, softly canescent. *h.* 1½ft. Peru, 1786. (B. R. 909.)

ENCHOLIRION (from *engchos*, a spear, and *Leirion*, a Lily; in allusion to the habit of the genus). SYN. *Prionophyllum*. ORD. *Bromeliaceæ*. A genus embracing about half-a-dozen species of stove, perennial herbs, natives of Brazil. Flowers in a terminal, simple or slightly branched, long, dense raceme; sepals free, short, ovate, imbricated; petals much longer, free, narrow, erect or somewhat

Encholirion—*continued.*

spreading from the base; stamens free, the filaments filiform. Leaves rosulate, long, narrow, rigid, generally spinulose-serrated. For culture of the plants introduced, *see* **Tillandsia**, on p. 41.

E. corallinum (coral-flowered). *fl.* numerous, on an erect scape longer than the leaves; sepals yellowish or greenish, thick, shining, exuding a diaphanous, gummy substance; petals pale yellow, longer than the sepals; bracts purple-violet, foliaceous, half-amplexicaul. *l.* quite entire, canaliculate, obtuse, mucronate, 1½ft. long. 2in. broad, glaucous-violet below, and with a greenish-blue tint above transversely marked with dark, wavy lines. (I. H. xviii. 70.)

E. c. splendens (splendid). *l.* more compact, more obtuse, and broader than in the type. 1885.

E. roseum variegatum (rosy-variegated). *l.* striped with yellowish bands. 1884. An ornamental plant, of garden origin.

FIG. 26. ECHINOPSIS EYRIESII FLORE-PLENO.

ENGELMANNIA (named in honour of George Engelmann, 1810-1884, a German botanist, who wrote on

Engelmannia—*continued.*

American plants). SYN. *Angelandra.* ORD. *Compositæ.* A monotypic genus. The species is an erect, hardy, perennial, pubescent herb. It thrives in ordinary garden soil, and may be increased by seeds or by divisions.

E. pinnatifida (pinnatifid). *fl.-heads* golden-yellow, 1in. to 2in. in diameter, corymbosely paniculate; involucral bracts in several series; ray florets eight to ten, female; disk hermaphrodite, but sterile. July. *l.* petiolate, 2in. to 5in. long, oblong, sinuate-pinnatifid to below the middle; lobes toothed, entire, or lobulate. *h.* 1ft. to 2ft. Prairies of North America, 1881. (B. M. 6577.)

EOMECON (from *eoos*, Eastern, and *Mekon*, a Poppy; so called on account of its systematic position close to the Poppies, and its native country in Eastern Asia). ORD. *Papaveraceæ.* A monotypic genus. The species is a beautiful, hardy, perennial herb, intermediate between *Stylophorum* and *Sanguinaria*, differing from both in the scapose habit, racemose flowers, and sepals confluent in a boat-shaped spathe; and further from *Stylophorum* in the colour of the flowers and form of the leaves, and from *Sanguinaria* in the four petals, elongated style, and stigmatic lobes alternating with the placentas. It thrives in any fairly good soil, and may be increased by divisions.

E. chionantha (snowy-flowered). *fl.* white, with yellow stamens, Poppy-like, 1½in. to 2in. in expanse; pedicels slender; flower-stem loosely branched. Summer and autumn. *l.* all radical, long-stalked, with a roundish-cordate, sinuate or coarsely crenate blade, 3in. to 4in. long and nearly as broad. China, 1885. (B. M. 6871.)

EPACRIS. To the species and varieties described on pp. 511-2, Vol. I., the following should now be added:

E. purpurascens. Two very attractive, double varieties are: *alba*, with blush-white, and *nivalis*, with pure white, flowers. 1883.

EPIDENDRUM. Tropical America is the headquarters of this genus. To the species and varieties described on pp. 512-4, Vol. I., the following should now be added. Unless otherwise specified, stove treatment is required.

E. amabile (lovely). A synonym of *E. dichromum.*

E. arachnoglossum (cobweb-lipped). *fl.* reddish-purple (carmine-violet), in a short, corymbiform or roundish raceme; sepals and petals acute, recurved; lateral lobes of lip roundish, pectinate, the middle one cuneate, deeply bilobed; column violet, club-shaped. *l.* distichous, alternate, glabrous, sessile, oblong-lanceolate, obtuse, fleshy. Stems tufted, erect, naked above. New Grenada, 1883. (R. H. 1882, p. 554.)

E. a. candidum (white). *fl.* wholly white, with the exception of the orange lateral calli of the lip. 1886.

E. atropurpureum album (white). A white-lipped variety.

E. a. Randi (Rand's). *fl.*, sepals and petals greenish-brown, with paler margins; lip white, large, marked with contiguous, red veins at the base. Amazons, 1886. SYN. *E. Randianum* (L. 49).

E. Barkeriola (Barkeriola). *fl.*, sepals and the light rose-coloured petals nearly equal; lip white, with a deep purple blotch and some short purple lines on the disk, where there are two raised lines, pandurate or obovate; raceme one-sided. *l.* lanceolate, acute, wavy, reddish beneath and on the margins. 1884. SYN. *Barkeria Barkeriola.*

E. Christyanum (Christy's). *fl.* greenish and brown, in an erect raceme; sepals oblong, apiculate; petals spathulate; lateral segments of lip sub-quadrate, extrorse, the middle one triangular, apiculate; column trifid. *l.* ligulate, acute. Pseudo-bulbs long-pyriform, two-leaved. Bolivia, 1884.

E. ciliare (ciliated). *fl.* fragrant, several in a raceme, each with a long bract at base; sepals and petals greenish-yellow, linear, acute; lip white, three-parted, the lateral lobes pectinately incised, the middle one setaceous, much longer. Winter. *l.* in pairs. Pseudo-bulbs oblong, obtuse. Tropical America. (B. R. 784.) *E. cuspidatum* (B. M. 463; B. R. 783; L. B. C. 10) is considered a variety of this species, but the flowers are yellower and larger, and the middle lobe of the lip is linear-lanceolate, and not appreciably longer than the side ones. 1844.

E. cuspidatum (cusp-pointed). A variety of *E. ciliare.*

E. densiflorum (dense-flowered). A variety of *E. polyanthum.*

E. Endresii (Endres'). *fl.* as large as those of *E. ellipticum*; sepals white, tipped green, the upper one cuneate-oblong, acute, the lateral ones triangular; petals white, spathulate; lip blotched mauve, curiously cut, with two triangular edges at the base, the anterior lacinia cuneate-obreniform. *l.* about a dozen, like those of Box. Costa Rica, 1883. (G. C. n. s., xxiii., p. 504.)

Epidendrum—*continued.*

E. Flos-aëris (air-flower). A synonym of *Arachnanthe moschifera.*

E. fraudulentum (fraudulent). *fl.* light rose-coloured, small, the column and lower part of the ovary purple, the keel and calli yellow. 1886.

E. fulgens (brilliant) A synonym of *E. Schomburgkii.*

E. ibaguense (Ibague). *fl.* in a dense, almost globose head; sepals and petals orange; lip yellow, obcordate, the lateral lobes cordate, rounded at the tip and fringed. *l.* very fleshy, amplexicaul, oblong, obtuse. Stems tall, slender, the upper portion leafy, the extreme end leafless. New Grenada, Peru. (F. M. 390.)

E. ionocentrum (violet-spurred). *fl.*, sepals and petals lemon-coloured, spotted with greenish-brown, lanceolate, acuminate; lip white, violet or purple in the centre; raceme twenty to twenty-four flowered. Pseudo-bulb broad. Otherwise like *E. Brassavolæ.*

E. Kienastii (Kienast-Zölly's). *fl.*, sepals and petals very light rose, with darker purple veins, the sepals lanceolate, the petals very cuneate at base; lip white, with fine purple, callose lines on the wavy mid-partition, the side partitions cuneate-ligulate, two-toothed outside; raceme several-flowered. *l.* usually two, 6in. long, ½in. to 1in. broad, cuneate-oblong, acute. Mexico, 1887.

E. Mathewsii (Mathews'). *fl.*, sepals and petals stained purplish outside, small, nearly transparent, the lateral sepals connate half-way up; lip deep, dull blood-purple, shining, orbicular, bifid at apex, convex above, concave beneath, completely concealing the lateral sepals. *l.* distichous, rigid, fleshy. Stems short, procumbent. 1886.

E. O'Brienianum (O'Brien's). A hybrid between *E. evectum* and *E. radicans*, and in habit very much resembling the latter. In colour the flowers are a brilliant carmine, faintly shaded orange, except the crests on the lip, which are bright yellow, as in *E. radicans*; the segments are longer than in *E. evectum*, but have the same general shape, and the lobes of the lip are much like those of the last-mentioned species. The plant, like its parents, grows rather tall.

E. oncidioides (Oncidium-like). *fl.* yellow, blotched brown, very fragrant; sepals and petals obovate, unguiculate; lip three-lobed, the lateral lobes narrow, obtuse, flat, much shorter than the roundish, cuspidate middle one, the disk three-keeled; panicle long, racemose. *l.* two or three, 2ft. long, 1½in. wide. Stem 3ft. to 4ft. high. Surinam. (B. R. 1623; I. H. ser. v. 28.)

E. paytense (Payta). *fl.* of a brilliant scarlet-vermilion, with some orange on the lip, which is also marked with some darker spots. *l.* short, very strong, oblong, acute, tinted purplish-brown. Shoots stiff, with purplish-brown sheaths. Columbia and Peru, 1885.

E. polyanthum (many-flowered). *fl.* orange or salmon-colour, with a strong scent of cowslips; sepals ovate-lanceolate, acute, striated; petals linear, reflexed; lip three-lobed, three-ribbed, the lateral lobes sub-cuneate, retuse, the middle one retuse; panicle strict, simple. *l.* distichous, ovate-lanceolate, acute. Mexico, 1841.

E. p. asperum (rough). A variety having the ovaries and rachis densely covered with small warts. 1885.

E. p. densiflorum (dense-flowered). *fl.* greenish, with a little pink on the edges and in the middle of the lip. 1836. SYN. *E. densiflorum* (B. M. 3791).

E. pristes (saw-like). *fl.*, sepals and petals light cinnabar, lanceolate, the petals serrated in the upper half; lip yellow, spotted cinnabar, trifid, serrated, the mid-lobe small, bilobed, with a flexuose keel at the base of the disk. *l.* very minutely serrulated. Stems slender. 1886. A handsome plant.

E. pseudepidendrum auratum (golden). *fl.*, disk of the lip crimson, the borders deep orange. 1885. A fine variety.

E. punctulatum (slightly dotted). *fl.* stellate, in a slender panicle; sepals and petals brown inside, green outside, lanceolate, acute; lip sulphur, with minute dots, trifid, the side laciniæ square, the middle one sessile, ovate, acute, the mid-nerves thickened; column brown and green; border of the anther-bed white, spotted brown. Mexico, 1885. Greenhouse.

E. Randianum (Rand's). A synonym of *E. atropurpureum Randi.*

E. Sceptrum (sceptre). *fl.* small, sometimes three dozen in a raceme; sepals and petals golden-yellow, spotted dark purple, the sepals lanceolate, the petals obovate; lip white at base, profusely marked bright purple; racemes 1ft. to 2ft. long. September and October. *l.* long, thin, remote, lorate. Pseudo-bulbs pear-shaped, compressed, 1ft. long. Venezuela. New Grenada.

E. Schomburgkii (Schomburgk's). *fl.* rich vermilion-scarlet; sepals and petals linear-lanceolate; lip three-lobed, strongly keeled, bicallose at base, the lateral lobes broadly semi-ovate, rounded and lacerated behind, the front lobe cuneate, gradually widening upwards, the edge denticulate, the apex shortly cuspidate; raceme short, close or corymbiform. *l.* distichous, oblong, obtuse, fleshy. Demerara, &c. A handsome species (B. iv. 165; B. R. 1838, 53.) SYN. *E. fulgens.*

Epidendrum—*continued.*

E. Stamfordianum Leeanum (Lee's). *fl.*, sepals and petals ochre-coloured inside, covered with purple, hieroglyphic markings, scarcely translucent outside; lip light rose, purple-spotted inside, broad. 1887.

E. S. Wallacei (Wallace's). *fl.*, middle lacinia of the lip obcordate, quite entire and very narrow; column shorter than in the type. Mountains south of Bogota, 1887.

E. stenopetalum (narrow-petaled). *fl.* rose-coloured, few, produced at the tips of the pseudo-bulbs; lip a little darker than the sepals and petals, having a square, white area at the base, with a small, yellow crest, adhering to the column for quite half the latter's length. West Indies and Central America, 1887.

E. trachychilum (rough-lipped). *fl.* very leathery, disposed in a dense, much-branched panicle; sepals and petals olive-brown, the sepals oblong, much-spreading, the petals somewhat conformed; lip deep yellow, studded with red warts, white and spotted pink on the callus, brilliant green with red warts on the lower lobes. *l.* straight, ensiform, much shorter than the scape. Pseudo-bulbs elongated, two-leaved. Mexico, 1885. Greenhouse. (R. G. 1205.)

FIG. 27. EPIDENDRUM VITELLINUM, showing Habit and detached Flower.

E. vitellinum giganteum (gigantic). A synonym of *E. v. majus.* (W. S. O. ser. iii. 27.) The type is shown in Fig. 27.

E. Wallisii (Wallis'). *fl.* numerous, about 1½in. across, scented; sepals and petals golden-yellow, spotted carmine-crimson, ligulate-oblong; lip white, with radiating, tubercled lines of magenta-purple, broad, cuneately flabellate; racemes drooping. October and November. *l.* distichous. Stems several feet in height, spotted brownish-purple, leafy. New Grenada. (W. O. A. ii. 74.)

EPILOBIUM. To the species described on p. 514, Vol. I., the following should now be added:

E. nummularifolium (Moneywort-leaved). *fl.* pink or whitish, very small; peduncles axillary, slender, ¼in. to 4in. long. *l.* two to four lines long, sessile or petiolate, numerous, opposite, rather crowded, orbicular or oblong, obtuse, flat or convex. Branches 2in. to 6in. long, glabrous or pubescent. New Zealand. Plant prostrate, hardy.

EPIPHYLLUM. To the species and varieties described on p. 517, Vol. I., the following should now be added:

E. Gibsoni (Gibson's) *fl.* two to four, of a beautiful, dark orange-red, produced at the ends of the branches, having some straight hairs at their base. 1886. This plant closely resembles *E. truncatum.*

E. Guedeneyi (Guedeney's). *fl.* large; outer petals white, slightly tinged with sulphur; the others pure creamy-white; stamens much shorter than the petals. Stems very broad, thin, with roundish, shallow notches. Probably of garden origin.

Epiphyllum—*continued.*

E. Russellianum Gærtneri (Gærtner's). *fl.* scarlet, 2½in. to 3in. in diameter; petals lanceolate, acute, radiating. 1885. A showy, garden hybrid, of unknown parentage, with the habit of *Epiphyllum* and the flowers of *Cereus.* (R. G. 1172.)

ERANTHEMUM. Flowers white, pink, red, or lilac, variously disposed; calyx deeply five-cleft, the segments short, narrow, sub-equal; corolla tube elongated, the limb spreading, five-partite; stamens two. Leaves entire, or rarely deeply toothed. To the species described on p. 518, Vol. I., the following should now be added:

E. borneënse (Borneo). *fl.* crowded round the rachis, forming a conical inflorescence; calyx ⅛in. long; corolla white, with a faint tinge of lemon, the tube 1in. long, cylindric, the limb 1½in. in diameter, obscurely two-lipped, quite flat; spike 4in. to 6in. long; peduncle stout, erect. *l.* 4in. to 6in. long, shortly petiolate, ovate-oblong, acuminate, entire, rounded or acute at base, glabrous, studded with raphides. Borneo, 1882. A nearly glabrous shrub. (B. M. 6701.)

E. macrophyllum (large-leaved). *fl.* light blue, in terminal and axillary spikes; upper and side lobes of the corolla reflexed on the sides of the long, whitish tube; lower petal or lip projecting, and of a deeper blue than the other lobes. Winter. India, 1886.

E. velutinum (velvety). *fl.* of a deep rose-pink, in long spikes; tube slender, curved, 1in. long. *l.* deep velvety olive-green, bullate. 1886. A distinct and pretty shrub.

ERANTHEMUM (in part). Synonymous with **Dædalacanthus** (which *see*).

EREMURUS. To the species described on p. 519, Vol. I., the following should now be added:

E. aurantiacus (orange). *fl.*, perianth yellow, five to six lines long; raceme dense, 6in. long, when expanded 1½in. to 1¾in. in diameter; scape 1½ft. high, terete, puberulous. *l.* five or six, narrow-linear, erect, persistent, 1ft. long, two to three lines broad. Afghanistan, 1885. (R. G. 1168, b, g, h.)

E. Bungei (Bunge's). *fl.*, perianth bright yellow, ⅓in. long; pedicels erecto-patent; raceme oblong, dense, 4in. to 5in. long; scape terete, 1ft. long, glabrous. *l.* linear, 1ft. long, less than ⅓in. broad, firm, glabrous, the edges minutely ciliated. Persia, 1885. (R. G. 1168, a.)

ERIA. To the species described on p. 519, Vol. I., the following should now be added:

E. bigibba (twice-gibbous). *fl.*, sepals and petals light reddish, lanceolate, the sepals with green median nerves; lip whitish, with small, purple dashes at base, transversely trifid, the antrorse lateral laciniæ separated from the semi-ovate, obtuse middle one by a narrow isthmus; column yellowish-white, purple at the base inside; anther with two purple tumours at the top. *l.* long, petiolate, on a tumid, cylindraceous foot. Borneo, 1884.

E. Elwesii (Elwes'). *fl.* light brown, small; outer perigone connate, three-toothed; petals rhomboid; lip oblong, retuse, with two rounded lobes at base. *l.* nearly 1in. long, stalked, oblong, acute. Pseudo-bulbs depressed, covered with fibrous sheaths. 1885. A tiny plant.

E. Fordii (Ford's). *fl.*, sepals light yellowish-green, 1in. long, lanceolate, acute, keeled at back; petals yellowish-green, ovate-lanceolate, sub-acute; lip deep, dull yellow, veined crimson, narrow-oblong, obtuse, apiculate, with small, rounded, lateral lobes and three blunt keels on the lower half; racemes terminal, two or three-flowered. *l.* linear-lanceolate, acute, 8in. to 9in. long, 1½in. to 1¾in. broad, leathery. Pseudo-bulbs ovoid, somewhat compressed, smooth. Hong Kong, 1886.

E. lineoligera (line-bearing). *fl.* white, very thin; sepals and petals lanceolate, acute, curved; chin moderate; lip cuneate-dilated, trifid, the side laciniæ triangular, curved, very short, the middle one projecting, triangular, apiculate, crenulate, undulated, with purple lines on each side; raceme nearly basilar, ascending, with orange bracts. *l.* four, rather thick, cuneate-oblong-lanceolate. Pseudo-bulbs fusiform. Siam, 1885.

E. monostachya (one-spiked). *fl.*, sepals and petals greenish-yellow; lip having a very small anterior lacinia, and two angular calli between the sinuses between the lateral and anterior laciniæ; inflorescence simple. Java, 1885.

E. muscicola (Moss-growing). *fl.* yellowish-green, very small, racemose. *l.* about ¼in. long. Pseudo-bulbs racemose. Ceylon, 1887. An insignificant species.

Eria—*continued.*

E. rhodoptera (red-winged). *fl.*, sepals whitish-ochre, as well as the pedicels, ovaries, and bracts; petals purple, ligulate, subfalcate, broad; lip trifid, the lateral segments purple, semi-oblong, produced, the middle one ligulate, retuse, emarginate; raceme elongated. *l.* linear-ligulate, acute. Stems cylindrical. 1882.

E. Rimanni (Riman's). *fl.* of a pellucid, pale yellow, the front lobe of the lip golden-yellow, with two purple spots; raceme nodding, dense, covered with a few reddish hairs. *l.* cuneate-oblong, acute, very leathery, light green, with dark nerves. Pseudo-bulbs pyriform, about 3in. long. Birma, 1885.

E. striolata (slightly striated). *fl.*, sepals and petals light ochre-coloured, linear-ligulate, acute, the former marked with three stripes and the latter with one stripe of reddish-purple; lip ligulate, with very blunt side lobes, and three conspicuous, partly crenulate, yellow keels; raceme dense-flowered, the rachis only slightly hairy. *l.* cuneate-oblong, acute, very fleshy. Papuan Islands, 1888. (I. H. 1888, 48.)

ERICA. The following species are included in the British Flora: *E. carnea* (Mediterranean Heath), *E. ciliaris* (Ciliated Heath), *E. cinerea* (Scotch Heath, Scotch Heather), *E. Tetralix* (Cross-leaved Heath), and *E. vagans* (Cornish Heath). To the species and varieties described on pp. 520-6, Vol. I., the following should now be added:

E. hyemalis alba (white). This variety differs from the type only in having pure white flowers. 1882.

E. Maweana (Mawe's). *fl.* purplish-crimson, produced in clusters, after the manner of those of *E. Tetralix* and *E. ciliaris*. Autumn. Stems sub-erect, much-branched, forming soft, ornamental bushes 1ft. to 1½ft. high. 1882. Hardy.

E. Mooreana (Moore's). *fl.* in large, terminal umbels of a dozen or more; corolla bright, glossy crimson-red, with a ring of black at the mouth, ventricosely tubular, above 1in. long, the lobes pink, roundish; pedicels red, with gland-bordered bracts. *l.* in whorls of four, very much recurved, fringed with twisted ciliæ, and tipped with a long awn. 1882. Hybrid.

ERIGERON. To the species described on pp. 526-7, Vol. I., the following should now be added. It is a very floriferous and pretty border plant. Cuttings should yearly be put into a cold frame, in case the old plants outside are killed during the winter.

E. mucronatus (mucronate).* *fl.-heads* pedunculate; involucral scales linear, subulate, puberulous; ray florets white, biseriate, twice as long as those of the disk. Summer and autumn. *l.* lanceolate, attenuated at base, ciliated, entire, or lobed or toothed above the middle. *h.* 6in. to 12in. Stem terete, branched. Mexico. Perennial. SYN. *Vittadinia trilobata.*

ERIOPSIS. Flowers showy, pedicellate; sepals equal, spreading, free, or the lateral ones connate with the foot of the column in a very short chin; petals similar to the sepals; lip affixed to the foot of the column, shortly incumbent, at length erect, the lateral lobes broad, erect, loosely enfolding the column, the middle one small, spreading, entire or two-lobed; column rather long, incurved; pollen masses two. Leaves usually two, long, ample. To the species described on p. 528, Vol. I., the following should now be added:

E. Sprucei (Dr. Spruce's). *fl.*, sepals and petals light yellow, the latter with red borders; side lobes of the lip whitish, dotted red, nearly circular, the middle one lemon-yellow, with mauve spots at the base of the broad stalk, transversely elliptic, the disk white, with two acute horns on the middle; raceme long, cylindrical. *l.* cuneate-oblong, acute. Amazons, 1884.

ERITRICHIUM. This genus comprises about seventy species. Flowers blue or white, in simple or branched racemes, or rarely nearly all axillary; calyx deeply five-cleft or five-partite; corolla tube short or rarely longer than the calyx, the lobes five, imbricated, obtuse, spreading; stamens five, affixed to the tube, included. Nutlets four, or fewer by abortion. Leaves alternate or (in very few species) opposite, usually narrow. To the species described on p. 529, Vol. I., the following should now be added:

E. barbigerum (beard-bearing). *fl.* white, small, much resembling those of a Myosotis, disposed in branching, scorpioid cymes; calyx lobes linear, about ¼in. long. Summer and autumn. *l.* lanceolate. California, 1886. A pretty annual; the whole plant clothed with long, spreading hairs. (R. G. 1886, pp. 358-9, f. 42; R. H. 1885, p. 552, f. 99.)

ERYTHEA. To the species described on p. 530, Vol. I., the following should now be added:

E. aculeata (prickly), of Regel. A synonym of *E. armata.*

E. armata (armed). *fl.*, spadix tomentose, paniculate, pendent. *l.* large, fan-shaped, palmatisect, glaucous; margins of the petioles armed with spines. California, 1887. SYNS. *E. aculeata* of Regel (R. G. 1887, 279, f. 74), *Brahea Roëzlii.*

ERYTHRINA. To the species described on pp. 531-2, Vol. I., the following should now be added:

E. vespertilio (bat-like). *fl.* numerous, in showy, erect racemes, pendulous; standard ovate, nearly 1½in. long. *l.*, leaflets obversely triangular, cuneate at base, the front side deeply hollowed out, so as to leave the two front angles projecting, the hollowed portion having sometimes a central apiculus. Western Australia, 1885. A grotesque, warm greenhouse shrub. See Fig. 28, for which we are indebted to Mr. Wm. Bull.

ERYTHRONIUM. This genus now embraces eight species, seven of which are North American. To those described on p. 533, Vol. I., the following should now be added:

E. dens-canis sibiricum (Siberian). *fl.* of a deep rosy-purple, banded purplish-crimson near the base of each division, and with a creamy-yellow eye.

E. Hendersoni (Henderson's).* *fl.* drooping, faintly scented; perianth campanulate, about 2in. in diameter, the segments pale lilac, spotted dark purple at base, reflexed from half-way down; peduncle 6in. to 8in. long, one or two-flowered. April. *l.* two, opposite, oblong, dull green, spotted purplish-brown, narrowed to a long, channelled base. Oregon. (B. M. 7017.)

E. purpurascens (purplish). *fl.* light yellow, tinged with purple, deep orange at the base, usually four to eight in a sub-umbellate raceme from 1in. to 1½in. long. May. *l.* large, more or less oblong, frequently undulated. Bulb 1in. to 2in. long. Sierra Nevada.

E. p. uniflorum (one-flowered). *fl.*, peduncles slender, one-flowered. SYN. *E. revolutum.*

E. revolutum (revolute). A synonym of *E. purpurascens uniflorum.*

ESCALLONIA. To the species described on pp. 533-4, Vol. I., the following should now be added:

E. Berteriana (Bertero's). A synonym of *E. pulverulenta glabra*

E. pulverulenta glabra (smooth). *fl.*, calyx shining and clammy; petals elliptic-oblong, sessile; racemes spicate, terminal, simple, twice as long as the leaves. *l.* elliptic, serrated, shining above, 2½in. to 3in. long, 1½in. broad; petioles ¼in. long. *h.* 5ft. to 6ft. Chili. Plant glabrous, clammy from resin. SYN. *E. Berteriana.*

E. revoluta (revolute). *fl.* white, ⅜in. long, spreading, pedicellate; petals with a long, straight claw, and a short, oblong, rounded limb; racemes or panicles terminal, sessile, erect, simple or thyrsoid. September. *l.* ¾in. to 1¼in. long, obovate, acute or cuspidate, toothed, pubescent. *h.* 10ft. to 20ft. Chili, 1887. (B. M. 6949.)

E. Sellowiana (Sellow's). *fl.* white; calyx teeth short, entire; petals spathulate; panicles terminal, many-flowered. Summer. *l.* lanceolate, tapering into the petioles, serrated, resinous-dotted beneath. Branches erect. *h.* 10ft. to 20ft. Brazil. Plant glabrous.

ESMERALDA. Included under **Arachnanthe** (which *see*).

ESMERALDA CLARKEI. A synonym of **Vanda Clarkei** (which *see*).

EUCALYPTUS. Calyx tube turbinate or campanulate, the base adnate with the ovary, the apex truncate, entire or remotely toothed; stamens numerous, in several series, free. To the species described on pp. 535-6, Vol. I., the following should now be added:

E. ficifolia (Fig-leaved). *fl.* showy; calyx slightly tinged with red; filaments beautiful cinnabar-red. *l.* conspicuously stalked, leathery, always somewhat decurrent into the stalk, pointed at the apex, or sometimes narrowly so. A tree seldom exceeding 50ft. in height in its native forests.

EUCHARIS. Flowers white, showy, many in an umbel; perianth tube cylindrical, straight or recurved, the lobes sub-equal, rather broad, spreading; stamens shorter than the lobes; bracts numerous, narrow, the two or three outer ones broader, involucral. Leaves petiolate, broad. Bulb tunicated. To the species described on p. 536, Vol. I., the following should now be added:

Eucharis—*continued.*

E. Mastersii (Dr. Masters'). *fl.*, perianth tube 2in. to 2½in. long; limb 3in. in diameter, the segments ovate, much imbricated; staminal cup striped green; pedicels short; umbel two-flowered; scape less than 1ft. long. February. *l.* distinctly petiolate, oblong, acute, 8in. to 10in. long, 4in. to 5in. broad. Bulb 1½in. to 2in. in diameter. New Grenada, 1885. (B. M. 6831 A.)

E. Sanderi multiflora (many-flowered). *fl.* five or six, considerably smaller than those of the type; stripes of the staminal cup green. New Grenada, 1885. (B. M. 6831 B.)

EUCOMIS. Flowers pedicellate, in a dense or elongated raceme; perianth persistent, with six sub-equal, spreading segments; stamens six; scape simple, leafless. Leaves radical, oblong or elongated. Bulb tunicated, often rather large. To the species described on pp. 537-8, Vol. I., the following should now be added:

E. pallidiflora (pale-flowered). *fl.*, perianth 1½in. in diameter, the segments greenish-white, oblong, acute; raceme 1ft. long,

FIG. 28. UPPER PORTION OF PLANT OF ERYTHRINA VESPERTILIO.

Eucomis—*continued.*

2½in. in diameter, crowned with a tuft of thirty small leaves; peduncle 1½ft. to 2ft. long cylindrical. *l.* five or six to a stem, oblanceolate, sub-erect, over 2ft. long, 4in. to 5in. broad. 1887.

E. zambesiaca (Zambesi). *fl.* green; pedicels shorter; raceme longer and denser; scape not spotted. *l.* firmer. Otherwise like *E. punctata.* Eastern tropical Africa, 1886.

EULOPHIA. SYN. *Orthochilus.* This genus embraces nearly fifty species. To those described on pp. 538-9, Vol. I., the following should now be added:

E. guineënsis purpurata (purple). *fl.* handsome, in a loose raceme; sepals and petals dark, dull purple, narrow-lanceolate, acuminate; lip bright rose-purple, the front lobe elliptic-ovate, acute. Pseudo-bulbs globose, two or three-leaved. Western tropical Africa, 1883. A showy plant. (W. O. A. ii. 89.)

E. megistophylla (largest-leaved). *fl.* greenish-yellow, lined with brownish-red, panicled; sepals lanceolate, narrower than the petals; lip four-lobed, the lobes obtuse; spur very short, cylindrical; sheath ample, ochreous, oblong, acute. *l.* more than 1ft. long and 9in. broad, petiolate, cuneate-oblong, acute. Comoro Islands, 1885. A striking species. (R. H. 1887, p. 87.)

E. pulchra divergens (pretty, diverging). *fl.* purple-spotted, showy; sepals and petals oblong-linear, acute; lip going out into two diverging shanks; spur short and straight; raceme erect, many-flowered, equalling the leaves. *l.* oblong-lanceolate. Isle of Bourbon, 1884. The typical plant is not in cultivation.

EUONYMUS. About forty species are included here; they inhabit the mountainous parts of India, North China, Japan, Europe, and North America, a few being found in the Malay Islands. To those described on pp. 539-40, Vol. I., the following should now be added:

E. japonicus Carrièrei (Carrière's). A prostrate form that will make a picturesque rockwork plant. 1883. A vigorous, green-leaved, garden variety of *E. radicans.*

E. j. Chouveti (Chouvet's). *l.* thick, fleshy, very narrowly ovate-elliptic, glossy, rounded at tip, with a narrow margin of yellowish-white. A remarkable form, with erect branches. It bears cutting well, and makes an excellent ornamental border plant. 1887.

E. j. columnaris (columnar). *l.* shortly oval, rounded, sometimes sub-orbicular, thick, glossy, with broad, shallow teeth. A vigorous form, of columnar habit.

E. nanus (dwarf). *fl.* greenish-white, four-cleft, one to three on a peduncle. July and August. *l.* lanceolate, entire, nearly opposite, deep green. Branches smooth, somewhat herbaceous. Northern Caucasus, 1830. A neat, trailing under-shrub, suitable for the rockery. SYN. *E. pulchellus* (of gardens).

E. pulchellus (pretty). A garden synonym of *E. nanus.*

EUOTHONÆA. A synonym of **Hexisia** (which *see*).

EUPATORIUM. To the species described on p. 540, Vol. I., the following should now be added:

E. grandiflorum (large-flowered), of André. *fl.-heads* reddish, disposed in large, terminal corymbs. *l.* rugose, cordate, acute, serrated. 1883. An ornamental, hardy perennial. (R. H. 1882, p. 384.)

EURYA. Flowers small, sessile or shortly pedunculate, fascicled or rarely solitary in the axils; sepals five, imbricated; petals five, imbricated, coalescing at base; stamens fifteen or less, rarely five. Leaves often crenate-serrated and glabrous. To the species described on p. 542, Vol. I., the following should now be added:

E. vitiensis (Fiji). *fl.* small, axillary, unisexual, the males fascicled, the females usually in pairs. *l.* elliptic-lanceolate or oblong, serrulate, acuminate at both ends, shining. Fiji, 1887. Stove tree.

EUSTEPHIA (from *eu*, well, and *stephos*, a crown; in allusion to the circle of stamens). ORD. *Amaryllideæ.* A monotypic genus. The species, *E. coccinea*, is the plant described on p. 89, Vol. III., as *Phædranassa rubro-viridis.*

FAGUS. To the species described on p. 2, Vol. II., the following variety should now be added:

F. sylvatica tricolor (three-coloured). *l.* dark purplish-green, spotted with bright carmine-rose, and shaded with rosy-white. 1885. An ornamental garden variety.

FARADAYA (named in honour of Michael Faraday, the celebrated chemist, 1794-1867). ORD. *Verbenaceæ.* A small genus (about five species) of stove or greenhouse, tall-climbing, glabrous shrubs, natives of Australia, Fiji, New Guinea, &c. Flowers white, showy; calyx at first closed, ultimately cut into two or three valvate lobes; corolla tube exserted, enlarged above, the limb ample, spreading, four-cleft; stamens four, long-exserted; cymes many-flowered, disposed in a terminal, loosely corymbose panicle or sessile at the nodes. Leaves opposite, entire, coriaceous. Two species are in cultivation, but have not yet flowered in this country. They thrive in a rich loam, and require plenty of root room. The branches should be allowed to spread close to the glass, in as light a position in the stove as possible.

F. papuana (Papuan). *fl.* salver-shaped, disposed in corymbose panicles. *l.* lanceolate, bullate. Java, 1884.

F. splendida (splendid). *fl.* large, in a terminal, corymbose panicle; calyx segments eight to ten lines long; corolla tube above 1in. long, the lobes flat, nearly ⅔in. long. *l.* ovate, acuminate, rounded or cordate at the base, 6in. to nearly 12in. long, prominently penniveined; petioles 1in. to 2in. long. Queensland. A tall, woody climber.

FEDIA. To the species described on p. 4, Vol. II., the following variety should now be added:

F. Cornucopiæ floribunda plena (abundantly double-flowered). A handsome, tufted variety, producing its pretty, reddish-pink, double flowers in such profusion as to almost entirely hide the leaves. 1886. (R. G. 1218.)

FICUS. The number of species, according to specimens in herbaria, is upwards of 600; they are found in the warmer regions of the globe. To those described on pp. 11-12, Vol. II., the following should now be added:

F. Cannoni (Cannon's). The correct name of the plant described on p. 117, Vol. I., as *Artocarpus Cannoni.*

F. Cavroni (Cavron's). *l.* shortly petiolate, cuneate-obovate, obtuse, 1½ft. long, 9in. broad, dark green with a yellowish-white midrib above, rusty beneath. Brazil, 1887. Stove shrub.

F. elastica variegata (variegated). *l.* variegated with various shades of creamy-white and yellow. A beautiful form.

FORSYTHIA. A couple of species, natives of China and Japan, compose this genus.

F. intermedia (intermediate). A hybrid between *F. suspensa* and *F. viridissima.*

FRAXINUS. *F. excelsior* is the only British representative of this genus. To the species and varieties described on pp. 23-4, Vol. II., the following should now be added:

F. americana foliis argenteo-marginatis (silvery-margined leaved). An ornamental form, having the leaflets bordered with pale yellowish (or rosy in a young state). 1886.

F. turkestanica (Turkestan). *l.* pinnate; leaflets five, dark green, cuspidate, coarsely toothed. Buds reddish. Bark dark green, smooth. Turkestan, 1887.

FRITILLARIA. Including *Rhinopetalum*, &c. This genus is distributed over North temperate regions. To the species described on pp. 27-9, Vol. II., the following should now be added:

F. armena fusco-lutea (fuscous-yellow). *fl.* bright yellow inside, tinged coppery-brown outside, solitary, drooping, ⅝in. long. *l.* four to six, about 2in. long. *h.* 5in. to 6in. Smyrna, 1887.

F. bucharica (Buchara). *fl.* white, greenish or purplish at base; perianth segments ovate or ovate-lanceolate, obtusely acuminate, or rarely lanceolate or linear-lanceolate; raceme terminal, few or many-flowered. *l.* usually all alternate, ovate or lanceolate, the upper ones narrower. Stem erect, flexuous, 6in. to 18in. high. Buchara, 1884. (R. G. 1171.)

F. contorta (twisted). *fl.* nodding, 1½in. to 2in. long; perianth segments united (thus differing from all the other species). *l.* three or four, distant, lanceolate, somewhat fleshy. Origin unknown. 1886.

F. discolor (discoloured). *fl.* nine to twelve, light yellow, with a slight suspicion of green, 1½in. to 2in. across; segments oblong-lanceolate, slightly reflexed; throat marked with a blood-red ring; bracts numerous. *l.* erect, sessile, sub-amplexicaul, broadly lanceolate, glaucous, fleshy, about 3in. long and 1in. broad, with a tinge of red up the midrib on the under-side. *h.* 10in. 1888.

Fritillaria—*continued.*

F. imperialis inodora purpurea (scentless, purple). *fl.* dark crimson. Buchara, 1885. A handsome variety. (R. G. 1165.)

F. Perryi (Perry's). *fl.* approaching those of *F. recurva*, but produced in greater profusion, and appearing a fortnight earlier. 1886. A fine garden hybrid between *F. recurva* and *F. lanceolata*.

F. Raddeana (Dr. Radde's). *fl.* greenish-yellow, shorter than the pedicels. *l.*, floral ones recurved-spreading. Habit rather dwarfer than *F. imperialis*, which the plant otherwise resembles. Central Asia, 1887.

F. Sewerzowi bicolor (two-coloured). *fl.* light olive-green, having a brownish, V-shaped mark at the base of each segment. Alatau, 1885. A remarkable variety. (G. C. ser. iii., vol. i., p. 457; R. G. 1181.)

FUCHSIA. To the species and varieties described on pp. 31-5, Vol. II., the following should now be added:

F. ampliata (ample). *fl.* scarlet, solitary, or two or three together in axillary clusters; calyx lobes ovate-lanceolate, acuminate; petals shorter than the calyx lobes, obtusely quadrangular. June. *l.* 2in. to 3in. long, usually drooping and ternately whorled, elliptic-oblong, acute at both ends, denticulate, glabrous, sometimes pubescent beneath; petioles ¼in. to ½in. long. Stem often decumbent below. *h.* 3ft. to 5ft. Andes of Ecuador, 1877. (B. M. 6839.)

Varieties. The Fuchsia is one of the best-known greenhouse and conservatory flowering plants, and it is also the most graceful of bedding-out plants. Handsome, tall specimens, trained to centre stems, and placed in the centre of beds in the geometrical flower garden, have an excellent effect. So many splendid varieties have been raised that it is difficult to further improve them. The varieties with single corollas are the handsomest; indeed, some of the double forms are most inelegant, and may be classed as floral abortions. They may for convenience be divided into classes thus:

Single-flowered. *Varieties with White Tube and Sepals, and Red and Pink Corolla.* BEAUTY OF LAVINGTON; EMILY BRIGHT, a well-formed variety; EXCELSIOR, creamy tube and sepals; EYNSFORD GEM, corolla purplish-rose, petals neatly reflexed; LUSTRE IMPROVED, corolla orange-scarlet, a richer-coloured form of LUSTRE; LYE'S PERFECTION; MIZPAH, corolla distinct purplish-crimson; MR. F. BRIGHT; MRS. F. GLASS.

Varieties with Red and Scarlet Tube and Sepals, and Purplish, Bluish, or Mauve Corolla. AMIE, sepals crimson, unusually long, corolla dark purple; DR. SANKEY, corolla and tube nearly the same colour, rich reddish-crimson; ELEGANCE, sepals crimson, twisted like a ram's horn, corolla purple; KING OF THE FUCHSIAS, a very useful decorative variety, with crimson sepals and purplish corolla; SALOPIA, sepals crimson, corolla pale purple, widely opened; SWANLEY GEM, tube and sepals scarlet, corolla purplish-rose.

Double-flowered. BERLINER KIND, tube and sepals coral-red, corolla pure white, very double; BOREATTON, tube and sepals crimson, corolla dark purple, large and very double; CRÉPUSCULE, corolla faintly striped deep red; ELIZABETH MARSHALL, tube and sepals scarlet, corolla white, free-flowering; FRAU EMMA TOPFER, tube and sepals coral-red, corolla rosy-blush; LA FRANCE, tube and sepals deep red, corolla bluish-purple, very double; MADAME JULES CHRÉTIEN, tube and sepals scarlet, corolla white.

FURCRÆA. To the species described on pp. 37-8, Vol. II., the following should now be added:

F. Roëzlii (Roëzl's). *fl.* pale yellowish, 1¾in. in diameter, in clusters of three or four; scape 10ft. to 12ft. high, paniculate above, the unbranched part clothed with long, sheathing bracts. *l.* 4½ft. long, 4in. broad, narrowed towards the base, lanceolate, acuminate. Mexico, 1887. Greenhouse. (R. H. 1887, p. 353.) SYN. *Roëzlia regia* (of gardens).

FUSTIC-TREE. *See* **Chlorophora tinctoria.**

GABERTIA. A synonym of **Grammatophyllum** (which *see*).

GAHNIA (called after H. Gahn, a Swedish botanist of the eighteenth century). SYN. *Psittacorchœnus.* ORD. *Cyperaceæ.* A genus embracing about a score species of stove or greenhouse, perennial herbs, mostly Australian, a few inhabiting New Zealand, New Caledonia, the Malayan Archipelago, South China, and the South Pacific Islands. Spikelets blackish or brown, often two-flowered; glumes many; hypogynous bristles none; stamens three to six; panicle ample and loose or narrow and spike-like. Nut reddish-fuscous, whitish, or black, ovoid, obovoid, or sub-fusiform. Leaves usually long, terete, with a long, subulate acumen. It is doubtful whether the plant here described is the true *G. aspera*. For culture, *see* **Cyperus,** on p. 422, Vol. I.

Gahnia—*continued.*

G. aspera (rough). *fl.*, spikelets whitish-yellow; inflorescence terminal. *fr.* reddish-yellow. *l.* bright green, channelled, wavy, lanceolate. Fiji, 1887. An ornamental plant, of Arundo-like habit.

GALANTHUS. The species are confined to Europe and Western Asia. To the species and varieties described on p. 41, Vol. II., the following should now be added:

G. nivalis caucasicus (Caucasian). *fl.*, outer segments pure white, broader, more convex on the back, and with a narrower claw, than in the genuine *G. nivalis*, ¾in. to 1in. long, the inner ones obovate-cuneate, with a deep notch and two erect, rounded lobes, only marked green outside in a horse-shoe patch round the notch, but within streaked with green and white more than half-way down. The varieties *latifolius* (=*Redoutei*) and *virescens* belong to this sub-species.

GALEANDRA. To the species and varieties described on pp. 41-2, Vol. II., the following should now be added:

G. d'Escagnolleana (Baron d'Escagnolle's). *fl.*, sepals and petals brownish-ochre; lip white and sulphur, the median lobe marked with dark purple; spur funnel-shaped. *l.* narrow-lanceolate, acuminate. 1887. Allied to *G. Baueri lutea.* (I. H. ser. v. 22.)

G. Devoniana Delphina. *fl.*, sepals and petals reddish-brown, margined yellowish, lanceolate, acute; lip white, veined purple, large. Venezuela, 1887. A distinct variety, slenderer in all its parts than the type. (L. 80.)

G. flaveola (yellowish). *fl.*, sepals and petals yellowish, tinted sepia, lanceolate, acuminate; lip yellow, dotted hyaline-purple; apiculus of the anther having a black, anchor-like, terminal process; raceme eight-flowered. *l.* cuneate, linear, acuminate, ¼in. broad, the uppermost ones smaller. Stem more than 9in. long. 1887.

GALTONIA. This genus now embraces three species. Flowers white, showy, in a long, loose raceme; perianth tube rather broad, rounded at base, the lobes as long as the tube, spreading; stamens six, affixed to the throat or tube, shorter than the lobes; scape simple, leafless. Leaves few, radical. To the species described on p. 43, Vol. II., the following should now be added:

G. clavata (club-shaped). *fl.* scentless, arranged in a lax raceme; perianth tube clavate, about 1in. long, the segments ½in. long, oblong, obtuse; peduncle 2ft. high. Autumn. *l.* six or eight, sessile, lanceolate, glabrous, glaucous-green, 2ft. long. 1879. An unattractive plant. (B. M. 6885.)

GAULTHERIA. To the species described on p. 56, Vol. II., the following should now be added:

G. nummularioides (Moneywort-like). *fl.* resembling those of the Lily of the Valley, but frequently tinged rosy-pink, axillary. Summer. *fr.* scarlet. *l.* roundish, deep green, changing in autumn to dull rose, ciliated on the margins. Stems wiry, subprostrate. Himalayas, 1884. An ornamental, hardy evergreen, suitable for baskets. (G. C. n. s., xxii., p. 457.)

GAZANIOPSIS (from *Gazania*, and *opsis*, like; in allusion to the resemblance to *Gazania*). ORD. *Compositæ.* A monotypic genus, nearly allied to *Gazania* and *Gorteria.* It thrives in any well-drained garden soil, and may be increased by seeds, or by cuttings, inserted under a bell glass, in a cold frame.

G. stenophylla (slender-leaved). *fl.-heads* 3in. across, on long, leafless stalks; ray florets bronzy-green in the centre externally, of the richest golden-yellow internally; disk florets of the same colour; involucral bracts numerous, running together at the base into a cup, the free ends leafy, about 1in. long, linear, ciliate at the edges. *l.* deep green above, long, linear, grassy, snowy-white beneath. South Africa. The flowers have the same habit of closing in the after part of the day as those of *Gazania.*

GENISTA. To the species described on p. 58, Vol. II., the following should now be added:

G. sibirica (Siberian). *fl.* yellow. June to August. *fr.* brown. Stems erect. *h.* 6ft. Siberia, 1785. Plant slenderer than *G. tinctoria* (of which it is only a variety).

G. s. filifer (thread-bearing). *fl.* pale yellow, numerous. 1886. SYN. *Cytisus filifer.*

GENTIANA. To the species described on pp. 59-61, Vol. II., the following should now be added:

G. arvernensis (Auvergne). A beautiful little alpine Gentian, allied to *G. Pneumonanthe*, but more robust and tufted in habit, with much deeper blue flowers, and firmer and broader leaves. It lasts many weeks in blossom. 1882. Probably a new form of *G. Pneumonanthe*.

G. Bigelovii (Bigelow's). *fl.* violet, sessile, axillary, arranged in a leafy spike; calyx tube purplish, cylindric, with long-linear, green teeth; corolla about 1in. long, two subulate teeth alternating with the ovate, sub-acute lobes. August. *l.* linear or linear-oblong, 2in. long. *h.* 1ft. to 1½ft. New Mexico, 1886. (B. M. 6874.)

G. decumbens (decumbent). *fl.* blue, in a racemiform cyme; corolla narrow, obconical, with five short, ovate lobes. *l.* linear-lanceolate, scabrous on the margins. Stems ascending. Siberia. (R. G. 1087, f. 1-2.)

G. Fetisowi (Fetisow's). *fl.* deep blue, sessile, in terminal, compact clusters, and solitary or clustered in the axils; corolla tubular-campanulate, the segments slightly acute. July and August. *l.* narrow-lanceolate, five-nerved, entire; cauline ones connate; radical ones rosulate. Stem solitary, tall, erect. Turkestan, 1883. Plant highly glabrous. (R. G. 1069, f. 1-5.)

G. Kesselringi (Kesselring's). *fl.* whitish, dotted outside with violet, sub-sessile in glomerate, terminal racemes; corolla tubular-ventricose, the limb of five ovate, spreading lobes, shortly apiculate at apex. July and August. *l.*, radical ones numerous, linear-lanceolate, acute; cauline ones opposite, oblong-lanceolate. Stems about 8in. high. Turkestan, 1885. (R. G. 1087, f. 3-4.)

G. Moorcroftiana (Moorcroft's). *fl.* solitary at the ends of the branches or in leafy cymes; calyx tube ¼in. long; corolla pale blue, ¾in. to 1¼in. long, funnel-shaped, the throat naked and without folds, the lobes ovate, ½in. long. Summer. *l.* 1in. to 1½in. long, sessile, linear-oblong or elliptic, obtuse or sub-acute, nerveless. Stem simple or branched from the root. *h.* 4in. to 10in. Western Himalayas. Annual. (B. M. 6727.)

G. Olivieri glomerata (Olivier's compact). *fl.* deep blue, usually very numerous, sessile or nearly so, densely cymose-subcapitate or in an uninterruptedly glomerate raceme. July. *l.* as in *G. Fetisowi*, but narrower. Turkestan, 1883. (R. G. 1069, f. 6-7.)

G. sceptrum (sceptre). *fl.* deep blue, large, borne in terminal clusters. Stems fleshy, 1ft. to 2ft. high.

G. triflora (three-flowered). *fl.* blue, large and handsome, somewhat like those of *G. Pneumonanthe*. Late autumn. *l.* linear-lanceolate, smooth, glossy dark green. *h.* 1ft. Mountains of Central Asia. (R. G. 1189.)

G. verna æstiva (summer). A form with larger flowers than the type.

G. Wallichiana (Wallich's). *fl.* light blue, in axillary, terminal clusters. July and August. Stems 9in. to 12in. long, nearly prostrate.

G. Walujewi (Walujew's). *fl.* whitish, dotted pale blue, sessile, densely crowded in a head-like, terminal cyme; corolla ¾in. in diameter, the lobes elliptic-lanceolate, acute. Late summer. *l.*, radical ones numerous, coriaceous, lanceolate, narrowed into short petioles; cauline ones sessile, elliptic or lanceolate, opposite. Stems solitary or twin, growing erect from the rosette of radical leaves. Turkestan, 1884. (R. G. 1140.)

GEODORUM. SYNS. *Cistella*, *Otandra*. Of this genus about nine species have been enumerated: they inhabit the East Indies, the Malayan Archipelago, and Australia. To those described on pp. 61-2, Vol. II., the following should now be added:

G. Duperreanum (Baron Duperré's). *fl.* nine to fifteen in a spike; sepals and petals white, linear-oblong; lip white, with purple veins, concave. *l.* three or four, oblong-lanceolate. Cochin China, 1883. A pretty Orchid.

GERANIUM. To the species and varieties described on pp. 62-4, Vol. II., the following should now be added:

G. Lowii (Low's). *fl.* pink, in large clusters: stalks fleshy, 1ft. to 2ft. high. *l.* 3in. to 12in. in diameter, in five divisions, each division again deeply divided.

G. tuberosum Charlesii (Dr. Charles'). *fl.* rose-coloured, 1in. to 1½in. across, the petals enlarging till they fall off. *l.*, radical ones none; lowest cauline ones long-petiolate, the uppermost ones sessile. Afghanistan, 1885. (B. M. 6910.)

GERRARDANTHUS (called after W. T. Gerrard, a collector at Natal). ORD. *Cucurbitaceæ*. A small genus (three species) of stove or greenhouse, tall, glabrous climbers, natives of Western and Eastern tropical Africa. Flowers greenish or fuscous, dicœious; calyx five-lobed; corolla rotate or campanulate, deeply five-parted; males racemose, with four stamens and an imperfect fifth;

Gerrardanthus—*continued.*

females solitary, with an elevated, trigonal ovary. Fruit small, elongated, terete, many-seeded. Leaves membranous, cordate or hastate-cordate. *G. tomentosus*, the only species known to cultivation, is a stove perennial, of botanical interest. Mr. Wood, now Superintendent of the Natal Botanical Gardens, is recorded to have found, on the top of and between large stones, tubers, one of which "measured 6ft. in circumference, and was nearly 2ft. thick; its surface was scarred; and from the centre arose a stem not more than ¾in. in diameter, thickly covered with small, round tubercles, which ascended without a leaf to the top of trees 50ft. high. On turning over one of the tubers, it was found to have but one fibrous root, about ½in. thick. . . . The natives do not appear to put the plant to any use" ("Botanical Magazine," 6694). The plant may be increased by seeds.

G. tomentosus (downy). *fl.* yellow, ½in. in diameter, the males in short racemes, the females one or two together. *fr.* 3in. long, obovoid, ten-ribbed, dry, opening by three lobes. *l.* large, cordate-reniform, five-lobed. (B. M. 6694.)

GEUM. To the species described on pp. 66-7, Vol. II., the following should now be added:

G. rhæticum (Rhætian Alps). *fl.* golden-yellow, 1in. across. Summer. *l.*, radical ones 3in. to 5in. long, lyrate, interruptedly pinnate; side pinnæ with coarse, deep serrations; terminal leaflet large, heart-shaped, lobed. Stems numerous, 6in. to 8in. high, erect, with three or four small, pinnate leaves. An interesting natural hybrid between *G. montanum* and *G. reptans*, discovered on the south side of Monte Rosa, 1886. (R. G. 1229.) SYN. *Sieversia rhætica*.

GLADIOLUS. To the species and varieties described on pp. 70-1, Vol. II., the following should now be added:

G. Kotschyanus (Kotschy's). *fl.* light violet, about 1½in. long, with a nearly regular limb, the lower segments rather paler than the others, with a dark, median stripe; spike loosely few-flowered; scape 1ft. to 2ft. high, including the inflorescence. May. *l.* linear, 6in. to 8in. long. Afghanistan, Persia, 1886. (B. M. 6897.)

G. Papilio atratus (dark). A fine variety, the ground-colour of the flowers being dark purple instead of yellow. 1885.

G. watsonioides (*G. Watsonius*-like). *fl.* four to ten in a very lax, unilateral spike; perianth bright scarlet, the tube curved, 1½in. long, the segments oblong or ovate, acute, 1in. long; spathe valves curved, leafy, lanceolate. June. *l.*, produced ones about four, linear, erect, firm, 1ft. to 1½ft. long. Stem erect, 2ft. to 3ft. long, with usually a couple of much-reduced leaves below the inflorescence. Kilimanjaro, 1886. (B. M. 6919.)

G. Watsonius (Watson's). *fl.* two or three, each standing on a peduncle-like tube, enclosed by a bifid spathe; corolla bright red, funnel-shaped, the segments ovate-lanceolate, spreading. February and March. *l.* three or four, 3in. long, upright, rigid, flat, linear-lanceolate. Stem 1ft. to 1½ft. high. (B. M. 450.) A variety in which the segments are variegated with yellow from the base about half-way up, is figured in B. M. 569.

Varieties. The subjoined are the best forms of *G. gandavensis* quite recently introduced, and are all worthy of culture in select collections. They have all received the first-class certificate of the Royal Horticultural or some other established society.

ADMIRAL WILLIS, red, flaked crimson and violet; APPIANUS, white, with large rose blotch on lower petal; CALLIPHON, rose, flamed with deeper rose, light centre; CHARLES NOBLE, orange-scarlet, flaked and feathered rose; CROWN PRINCE, carmine, flaked and streaked crimson; DR. WOODMAN, salmon, flaked lake and rose; DUCHESS OF EDINBURGH, purplish-rose, flaked carmine; DUNI, crimson, shaded reddish-maroon; EGYPTIAN KING, maroon, flaked chestnut; HILDA, flesh, flaked and lined rose; JAMES DOUGLAS, rosy-lilac, flamed crimson; JAMES KELWAY, crimson and maroon, white lines; LORD RANDOLPH CHURCHILL, red, violet stripes; LORD SALISBURY, scarlet, crimson centre; LORD W. BERESFORD, amaranth, flaked lake; MELTON, salmon-red; MR. BAINES, orange-carmine, striped red; MR. MARSHALL, salmon-red, striped carmine; MR. STRIEDINGER, flesh, veined carmine; MRS. DOBRÉE, white and pale yellow; PRINCE ALBERT VICTOR, scarlet, flaked white; PRINCE GEORGE, crimson, scarlet, and white; PRINCESS BEATRICE, white, violet stripes; PRINCESS OLGA, white, flaked rose; ST. GATIEN, vermilion, flaked crimson; SAMUEL JENNINGS, scarlet and white blotches; SILENUS, crimson, with violet stripe; SIR MASSEY LOPES, orange-rose, with light centre; SIR TREVOR LAWRENCE, mulberry, flaked maroon; WILLIAM KELWAY, crimson-scarlet, blotched white.

GLAPHYRIA. Included under **Leptospermum** (which *see*).

GLEICHENIA. To the species described on pp. 72-3, Vol. II., the following variety should now be added:

G. rupestris glaucescens (glaucous). *fronds* glaucous, much thicker in texture than in the type.

GLOBBA. To the species described on p. 73, Vol. II., the following should now be added:

G. alba (white). *fl.* disposed in a loose, pendent, terminal panicle; calyx white, tubular; corolla lobes buff, lanceolate, the lip having a red, crescent-shaped blotch; bracts white, oval, obtuse. *l.* distichous, distant, sessile, horizontal, oval-elliptic, tapering to an acuminate apex, dark green above, dull brown beneath. Stems erect; rhizome horizontal, subterranean. 1885. (B. H. 1885, 20.)

G. albo-bracteata (white-bracted). *fl.*, calyx white; corolla yellow; flower-stem terminating in a lax panicle, of which the axis, branches, bracts, and bracteoles are white. *l.* seven or eight to a stem, ovate-lanceolate, green, 4in. to 5in. long. Stems brownish-purple, 2½ft. high. Sumatra, 1882.

GLOXINIA. To the species and hybrids described on p. 76, Vol. II., the following should now be added:

G. insignis (remarkable). *fl.* bluish-lilac, blotched crimson at base of tube. Autumn and winter.

G. maculata sceptrum (sceptre). *fl.* clear lilac, disposed in a large, rigid, terminal inflorescence. *l.* large, erect, cordate. Hybrid.

G. tubiflora (tubular-flowered). A synonym of *Achimenes tubiflora.*

Varieties. During the last few years these choice hothouse flowers have been greatly improved; they are large in size, of good form, and of the richest, diverse colours.

ANNA DE CONDEIXA, white, edged bluish-lavender; ARGUS, crimson and white; BARON ROTHSCHILD, white ground, striped and spotted rosy-red; CALYPSO, white, throat rosy colour; CELIA, purple, throat white, spotted purple; COMET, bright crimson-scarlet; CORDELIA, large, white, densely spotted; CYGNET, white, lilac margin; DELICATA, peculiar red feather, white margin; DESIRE ROBERT, deep purple, light throat; DURANDAL, crimson-scarlet, white throat; ETHEL, purplish, violet spots; FAVOURITE, rose spots, banded white; HELENA, margin purplish-rose, spotted throat; IRMA, scarlet, white throat; IVANHOE, purple, white centre, white margin; JUBILEE, spotted purple, paler margin; LOUISE, white, red margin; MACAULAY, pale rose and deep red; MADAME BLEU, magenta, white margin; MAHDI, carmine throat with violet spots, white border; MEANDRE, purple-crimson, white throat, lavender edge; METEOR, mottled, edged rose, distinct; MONS. LUCIEN LINDEN, white, crimson margin; MRS. C. A. HOOPER, white ground, violet spots; ORESTES, rich crimson, paler margin; ORMONDE, large, purple, spotted; RAJAH, bluish-purple, large; STANLEY, white, violet spots; STANSTEAD GEM, purple, splashed crimson; STANSTEAD SURPRISE, rosy-red, spotted throat; SUNBEAM, light scarlet, spotted throat; THE MOOR, very dark purple; TROPHEE, light rose and violet; VIRGINALIS, the best pure white variety.

GONGORA. To the species described on p. 80, Vol. II., the following should now be added:

G. aurantiaca (orange). *fl.* of a bright vermilion-orange, distantly arranged in nodding spikes, lasting a long time in perfection; scapes erect, about 1ft. high. Autumn and early spring. New Grenada. A distinct, evergreen species. SYN. *Acropera aurantiaca* (B. M. 5501).

G. flaveola (yellowish). *fl.* light ochre-yellow, spotted brown, distant; lip with a sigmoid claw, and having a median bristle and very small basilar horns to the basal part (hypochil); peduncle angulate, bearing a rich raceme. 1886.

G. Jenischii (Jenisch's). A synonym of *G. odoratissima.*

G. maculata alba (white). *fl.* pure white, with a few spots of rose on the lip. May. Pseudo-bulbs more deeply ribbed than in the type.

G. m. tricolor (three-coloured). A synonym of *G. tricolor.*

G. odoratissima (highly odorous). *fl.* clear yellow, mottled and blotched reddish-brown; upper sepal and petals adherent to the back and sides of the curved column, while the lip is continuous with its base, clawed, the basal part (hypochil) arched and laterally compressed, with a pair of petaloid processes on the back; the upper part (epichil) acutely elongate-ovate, the sides folded face to face; racemes drooping. *l.* broadly lanceolate. Venezuela. (F. d. S. 229.) SYN. *G. Jenischii.*

G. tricolor (three-coloured). *fl.*, sepals deep, bright yellow, blotched sienna-brown, the dorsal one lanceolate, affixed halfway up the back of the column, the lateral ones obliquely triangular; petals pale yellow, lightly spotted, small; hypochil

Gongora—*continued.*

white, oblong, convex, two-horned at base, the epichil stained on the sides with cinnamon; racemes stout, drooping. Pseudo-bulbs thickly ribbed. Panama or Peru. (B. R. 1847, 69, under name of *G. maculata tricolor.*)

G. truncata (truncate). *fl.* whitish or straw-coloured freckled brownish-purple; dorsal sepal obovate, carinate, the lateral ones roundish-oblong, very blunt; petals small; lip clear yellow, curved, the hypochil compressed in the middle and bearing two awns in front, the epichil ovate, channelled; pedicels mottled purple. Mexico. (B. R. 1845, 56.)

GONIOSCYPHA (from *gonia*, an angle, and *skyphe*, a cup; in allusion to the angled, cup-like perianth). ORD. *Liliaceæ* A monotypic genus. The species is a stove perennial, of striking appearance. It requires similar culture to **Anthericum** (which *see*, on p. 83, in Vol. I.).

G. eucomoides (Eucomis-like). *fl.*, perianth dull green, campanulate, with six sub-orbicular, very obtuse lobes; scape simple, leafless, bearing a dense, cylindrical spike of flowers, surmounted by a crown of fine, subulate bracts, similar bracts being mixed with the flowers. *l.* in a rosette, elliptic, acute, 1ft. long, 4in. to 5½in. broad. Rootstock short, fleshy. Bhoran, 1886.

GONOGONA. A synonym of **Goodyera** (which *see*).

GOODYERA. SYNS. *Gonogona*, *Peramium.* The species are found in Europe, Madeira, tropical and temperate Asia, and (according to Reichenbach) New Caledonia and the Mascarene Islands. To those described on p. 81, Vol. II., the following should now be added:

G. macrantha luteo-marginata (yellow-margined). *l.* distinctly margined with a band of creamy-yellow. Japan. Greenhouse. (F. d. S. 1779-80; F. & P. 1857, p. 227; G. C. 1867, p. 1022; R. G. 533, f. 2.)

G. Rodigasiana (Rodigas'). *l.* thick, ovate-lanceolate, acute, velvety, pale green, silvery in the middle; sheaths very shortly attenuated. Papua, 1886. Stove. (I. H. 1886, 616.)

G. Rollissoni (Rollisson's). *l.* rich, dark green, margined, striped, and blotched with pale yellow on the upper surface, rich velvety-purple beneath. Native country unknown. A beautiful, stove species.

G. tessellata (tessellated). A synonym of *G. pubescens minor.*

GORTERIA ACAULIS. A garden name for **Haplocarpha Leichtlinii** (which *see*).

GOVENIA. To the species described on p. 87, Vol. II., the following should now be added:

G. sulphurea (sulphur). *fl.* rather large; sepals light sulphur, the lateral ones rather broader than the cuneate-lanceolate upper one; petals white on the disk, sulphur on the margin, with numerous broken, purple lines; lip white, spotted dark brown at apex, cordate-oblong. *l.* scarcely 2in. broad, cuneate-lanceolate, acuminate. Pseudo-bulbs onion-like. Paraguay (?), 1885.

GRAMMATOPHYLLUM. SYNS. *Gabertia*, *Pattonia.* Flowers showy, on long pedicels; sepals and petals sub-equal, free, spreading; lip affixed above the base of the column, erect, concave, the lateral lobes rather broad, erect, loosely embracing the column, the middle one short, recurved-spreading, narrow or dilated; column erect, rather shorter than the lip; raceme loosely many-flowered; scape long, simple. Leaves distichous, often very long. To the species described on p. 92, Vol. II., the following should now be added:

G. elegans (elegant). *fl.* showy, six or seven on an erect peduncle 1ft. high; sepals sepia-brown, with ochre-yellow margins, oblong; petals the same colour, narrower; lip yellow, with brown markings in front and a hairy disk, trifid, the front lobe wedge-shaped and emarginate; column white, with a pair of brown lines below the stigma. *l.* elongated, distichous. Pseudo-bulbs rather large, oblong. South Sea Islands, 1883.

GREVILLEA. To the species described on pp. 97-8, Vol. II., the following should now be added:

G. annulifera (annulet-bearing). *fl.* sulphur-yellow, shortly pedicellate; perianth ½in. long; style upwards of 1in. long, curved, very stout; racemes 3in. to 4in. long, shortly pedunculate, panicled at the ends of the branches. July. *l.* spreading and recurved, 3in. to 5in. long, pinnate; segments 1in. long, distant, linear-subulate, rigid; petioles ½in. to 1in. long. *h.* 6ft. to 8ft. Shrub. (B. M. 6687.).

G. Hookeriana (Hooker's). *fl.* dull yellowish, about ½in. long, with long, crimson styles; racemes 2in. to 3in. long, dense, one-

Grevillea—*continued.*

sided. *l.* rigid, pinnate, having three to nine pairs of linear segments. 1886. (B. M. 6879.)

G. Thelemanniana splendens (splendid). *fl.* crimson, larger than in the type; spikes short, dense, recurved. *l.* bipinnatifid, rigid; segments linear. 1883. (R. H. 1882, p. 456.)

GUZMANNIA BULLIANA. A synonym of **Caraguata angustifolia** (which *see*).

GYMNOGRAMME. To the species and varieties described on pp. 104-5, Vol. II., the following should now be added:

G. calomelanos chrysophylla grandiceps (large-crested). A fine, crested variety.

G. farinifera (farina-bearing). *cau.* short. *stí.* quadrangular, channelled, blackish, minutely white-dotted. *fronds* white beneath, mealy above. 1886. One of the numerous varieties of *G. calomelanos*. (I. H. 1886, 604.)

G. Laucheana grandiceps (Lauche's, large-headed). *fronds* elongated, bipinnate, terminating in a broadly tasselled, drooping apex, the under surface clothed with palish-yellow meal; segments blunt at the end. 1882. A garden form of *G. calomelanos*. The most striking of all the Gold Ferns.

G. Pearcei robusta (stout).* *fronds* narrower at the base and more elongated towards the apex than in the type. 1888. Plant larger in all its parts.

GYMNOTERPE. A synonym of **Tapeinanthus** (which *see*).

GYNOPOGON. A synonym of **Alyxia** (which *see*).

HABENARIA. SYN. *Sieberia.* Flowers spicate or racemose; sepals sub-equal, free, or cohering towards the base; petals often smaller, sometimes deeply two-lobed; lip continuous and often very shortly connate with the column, having a short or long spur, and a spreading or pendulous, undivided or three to five-lobed lamina, the lateral lobes sometimes pectinate-fringed or ciliated; column very short. To the species described on p. 107, Vol. II., the following should now be added:

H. incisa (cut). *fl.* rich purple, small, fragrant, thickly set in oblong, terminal racemes. June. *l.*, cauline ones obtusely lanceolate, deep green. *h.* 1ft. to 1½ft. North America, 1826. SYN. *Platanthera incisa.*

H. macrantha (large-flowered). *fl.*, sepals and petals dark brown; lip purplish-lilac, marked with darker streaks and freckles, roundish; spike six to ten-flowered. *l.* sheathing, three-nerved. Sierra Leone, 1886. Stove. SYN. *Gymnadenia macrantha.*

H. militaris (military). *fl.*, lateral sepals green, oblong, acute, reflexed and revolute; petals green, strongly adhering to the green dorsal sepal, forming a cuculiate-navicular helmet; lip scarlet, the side lobes oblong-dolabriform, spreading, the front lobe bifid; raceme lax. *l.* linear, acute, 8in. to 9in. long, ½in. broad. *h.* 1ft. or more. Cochin China, 1886. Stove. (W. O. A. vi. 281.)

HABRANTHUS. The following plant is classed as a form of *Hippeastrum Bagnoldi* by Mr. Baker, in his recent revision of the *Amaryllideæ.*

H. punctatus (dotted). *fl.*, perianth drooping, funnel-shaped, the tube green, the segments milky-white, with beautiful red dots, spreading, revolute at apex, all equal; spathe two-leaved, green, herbaceous. *l.* at the time of flowering none. Chili, 1885. (R. G. 1163, f. 3.)

HÆMANTHUS. To the species described on p. 108, Vol. II., the following should now be added:

H. Bauerii (Bauer's). *fl.* white, a little shorter than the bracts; bracts white, ciliated, broadly obovate; umbel sub-sessile between the leaves. *l.* two, sub-orbicular, dark green, 5in. to 6in. long and broad, spreading on the ground. Kaffraria, 1886. A handsome, dwarf, greenhouse species. (B. M. 6875.)

HÆMARIA. Sepals equal, free, the dorsal one erect, connivent or coherent with the petals in a hood, the lateral ones spreading; lip affixed to the base of the short column. To the species described on p. 108, Vol. II., the following variety should now be added:

H. discolor Dawsonianus (Dawson's). The correct name of the plant described on p. 81, Vol. I., as *Anœctochilus Dawsonianus.*

HAKEA. To the species described on p. 109, Vol. II., the following should now be added:

H. laurina (Laurel-like). *fl.* rosy-lilac, in dense, globular, sessile, axillary clusters; pedicels about ¼in. long. Summer. *l.* narrowly

Hakea—*continued.*

elliptic-oblong or oblong-lanceolate, long-petiolate, 4in. to 6in. long, and (as well as the branches) hoary-tomentose or glabrous. *h.* 10ft. to 30ft. 1830. (G. C. n. s., xxv., p. 149.)

HAPLOCARPHA (from *haploos*, single, and *karphe*, chaff; in allusion to the one-rowed, chaffy pappus). ORD. *Compositæ.* A genus comprising four species of greenhouse or half-hardy, almost stemless, perennial herbs, natives of South Africa, one extending into tropical regions. Flower-heads yellow, rather large, solitary, heterogamous, radiate; involucre hemispherical, the bracts in many series; receptacle flat or convex, naked or slightly fimbrilliferous; ray florets ligulate, spreading, entire or minutely three-toothed; achenes turbinate. Leaves radical, entire or toothed, cano-tomentose or woolly beneath. *H. Leichtlinii*, the only species in cultivation, is a showy, free-flowering plant, requiring protection during the winter. It thrives in any fairly good soil. From the crown are produced numerous short shoots, which all flower; and by making cuttings of these the plant may be propagated.

H. Leichtlinii (Leichtlin's). *fl.-heads* 2in. to 2½in. in diameter; involucral scales free, the outer ones cobwebby-tomentose, the inner ones tipped dull purple; ray florets stained purple beneath, the disk of a deeper yellow; scape 1ft. long. *l.* 6in. to 12in. long, 2in. to 2½in. broad, lyrate-pinnatisect. 1883. SYN. *Gorteria acaulis* (of gardens).

HEDERA. To the varieties of *H. Helix* described on pp. 120-2, Vol. II., the following should now be added:

H. maderensis variegata (Madeira, variegated). *l.* deep green, with broad, silvery variegation. 1888. A fine form.

HEDYCHIUM. Flowers disposed in a terminal thyrse; calyx tubular, three-toothed; corolla tube elongated, the lobes narrow, equal, spreading. Stems erect, leafy, usually tall. To the species described on p. 123, Vol. II., the following should now be added:

H. peregrinum (foreign). *fl.*, calyx 1½in. long; corolla tube slender, 2½in. long, the petals light yellowish-green, very narrow, 1½in. long, the lip white, 1½in. long; outer bracts pale brown; spike 6in. long. *l.*, lower ones 4in. to 8in. long, elliptic, acute or acuminate, rounded at base; upper ones 1ft. to 1½ft. long, lanceolate or elliptic-lanceolate. Stem 3ft. to 4ft. high, leafy. Madagascar, 1885.

HEDYSARUM. To the species described on p. 123, Vol. II., the following should now be added:

H. microcalyx (small-calyxed). *fl.* bright violet-red, shortly pedicellate, 1in. long; calyx small, five-toothed; standard narrowly oblong-obovate, emarginate, equalling the narrow-linear wings; racemes axillary, sometimes 1ft. long, many-flowered; peduncles very long. June. *l.* 1ft. long or less; pinnæ eight to ten pairs, ¾in. to 1½in. long, opposite, petiolulate, oblong or ovate-oblong. Himalayas, 1887. A tall sub-shrub. (B. M. 6931.)

H. multijugum (many-paired). *fl.* pale vermilion-pink, disposed in axillary, eight to ten-flowered racemes, which are longer than the leaves. *l.*, leaflets twenty to forty, alternate, obovate or oblong, obtuse, silky-pilose beneath; petioles (and branches) silky-pilose. *h.* 2ft. to 5ft. South Mongolia, 1883. (R. G. 1122.)

HELENIUM. To the species described on p. 124, Vol. II., the following should now be added:

H. grandiflorum (large-flowered). *fl.* larger, deeper in colour, and possessed of a blacker disk than those of *H. pumilum*, which the whole plant resembles.

H. pumilum (dwarf). *fl.-heads* yellow; involucral scales spreading, lanceolate. August. *l.* oblong, nearly entire. *h.* 1ft. North America.

HELIANTHUS. To the species described on pp. 126-7, Vol. II., the following should now be added:

H. cucumerifolius (Cucumis-leaved). *fl.-heads* yellow, large, radiate. Summer. *l.* triangular-ovate, wavy, coarsely toothed, sub-cordate at base. 1883. Annual.

H. japonicus (Japanese). *fl.-heads* golden-yellow. Autumn. Perennial.

HELICODEA PORTEANA. *See* **Billbergia Porteana.**

HELICONIA. To the species described on pp. 128-30, Vol. II., the following should now be added:

H. nitens (shining). *l.* obliquely oblong-ovate, bright satiny-green. Mexico, 1883. A small, neat species.

H. viride (green). *l.* 1½ft. to 2ft. long, 6in. broad, pale green Polynesia, 1883. A fine plant, of graceful habit.

HELICOPHYLLUM (from *helix, helikos*, spiral, and *phyllon*, a leaf; alluding to the lateral segments of the older leaves). ORD. *Aroideæ* (*Araceæ*). A small genus (four or five species) of Asiatic, greenhouse or hardy, tuberous herbs. Flowers on an appendiculate spadix, the males and females remote, with subulate, neuter organs between; spadix much shorter than the spathe, slender or robust; spathe marcescent, the tube oblong, sub-ventricose, persistent, the lamina oblong, erect; peduncle much shorter than the leaves. Leaves long-petiolate, thickly coriaceous, hastate or sagittate, or the young ones hastate and the older ones pedatisect with segments confluent at base; lateral segments often spirally twisted. *H. Alberti* proves hardy in a sunny border, in a well-drained, sandy loam. It may be propagated from seeds, or by means of the small tuber offsets.

H. Alberti (Albert Regel's). *fl.* very fetid; spadix 5in. long, slender, the appendix bluish-black, ragged at tip; spathe 7in. long, the tube pale green, the lamina dark maroon-purple within, pale green outside, very thick, acuminate. May. *l.* 4in. long, hastate, acuminate, undulated, with two lateral, horn-like, horizontal, basal lobes, and between them two linear, erect ones; petioles stout, 4in. long. Bokhara, 1884. (B. M. 6969.)

HELIOPHILA. To the species described on p. 130, Vol. II., the following should now be added:

H. scandens (climbing). *fl.* white, sometimes tinted rose, large, racemose. *l.* lanceolate. Stems slender, twining. 1887. An interesting plant.

HELIOTROPIUM. To the species and varieties described on p. 131, Vol. II., the following should now be added:

H. incanum (hoary). *fl.* in dichotomously corymbose spikes; corolla white, twice as long as the calyx, rather hispid outside; peduncles hairy. June. *l.* thick, ovate, acute, crenulated, wrinkled above and lined with retrograde asperities, softer and hoary beneath. Stem shrubby. *h.* 2ft. to 3ft. Peru. Greenhouse.

H. i. glabrum (smooth). *fl.* purple. *l.* rough, broadly elliptic, destitute of hairs. 1884. (G. C. n. s., xxii., p. 809.)

HELONIOPSIS (from *Helonias*, and *opsis*, resemblance; alluding to the affinity of the genera). SYN. *Sugerokia*. ORD. *Liliaceæ*. A small genus (four species) of greenhouse or hardy perennials, natives of Japan and Formosa. Flowers solitary or few at the tip of the scape, rather large, slightly nodding; perianth segments distinct or scarcely connate at base, oblong or narrow, sub-equal, spreading; stamens six; scape erect, simple. Leaves radical, petiolate, oblong or lanceolate, scarious-sheathed at base. Rhizome short, horizontal. *H. japonica*, the only species in cultivation, thrives in any fairly good garden soil, and may be increased by divisions.

H. japonica (Japanese). *fl.*, perianth rose-coloured, five to six lines long, the segments free, narrow; stamens very shortly exserted; pedicels usually longer than the flowers; raceme short, two to ten-flowered. April. *l.* oblanceolate, at the flowering period 3in. to 4in. long and 1in. broad, brownish towards the tips. Japan, 1881. Wrongly called *H. umbellata* in G. C. ser. iii., vol. i., p. 711. (B. M. 6986.)

HEMEROCALLIS. This genus embraces five species, natives of Central Europe and temperate Asia, Japan especially. To those described on p. 134, Vol. II., the following variety should now be added:

H. fulva longituba (long-tubed). *fl.* orange-yellow, the slender tubular portion of the perianth half as long as the segments. Japan, 1885. (R. G. 1187.)

HEMIGRAPHIS (from *hemigraphos*, half-written; in allusion to the shape of the corolla). ORD. *Acanthaceæ*. A genus embracing about a score species of stove or greenhouse, annual or perennial herbs, inhabiting the East Indies, the Malayan Archipelago, China, and Japan. Flowers rather small, solitary or rarely twin, spicate; calyx deeply five-cleft or five-parted, the segments often more or less connate below the middle; corolla tube slender, shortly enlarged above, the limb of five rounded, spreading lobes; stamens four, didynamous, included; bracts often imbricated; bracteoles minute or wanting. Leaves opposite, entire or toothed. For culture of the

Hemigraphis—*continued.*

species described below, *see* the allied genus **Ruellia,** on p. 333, Vol. III.

H. colorata (coloured). *fl.* white; corolla narrow, six to seven lines long; spikes terminal, tetragonal, pedunculate. *l.* cordate-ovate, crenate, bullate, 2¾in. long, 1¾in. broad, tinted silvery-grey on the upper surface, purple beneath; petioles 1½in. long. Stem creeping, and, as well as the petioles, loosely hairy. India, 1885. Stove perennial.

H. latebrosa (secret). The correct name of the plant described on p. 333, Vol. III., as *Ruellia latebrosa.*

HEMIPILIA (from *hemi*, half, and *pilion*, a cap; alluding to the covering of the pollen mass). ORD. *Orchideæ*. A small genus (only two species) of stove Orchids, with the habit of *Habenaria rotundifolia*, natives of the East Indies. Flowers few in a raceme; sepals nearly equal in length, the dorsal one concave, the lateral ones spreading, oblique; petals smaller, undivided; lip continuous with the column, spreading, rather broad, the base produced in a spur; column very short. Stems having one leaf at the base. For culture of *H. calophylla*, *see* **Pogonia,** on p. 175, Vol. III.

H. calophylla (beautiful-leaved). *fl.*, sepals white and green, rarely purple; petals similar, but much smaller; lip dark vinous-purple, ¼in. broad; raceme six to eight-flowered; scape 5in. to 7in. high, green, spotted reddish-brown. July. *l.* 2in. to 3in. long, 1¼in. to 1½in. broad, sessile on the tuber, the acute base sunk in the ground, dark green, mottled brown. Moulmein, 1886. (B. M. 6920.)

HEPTAPLEURUM. To the species described on p. 136, Vol. II., the following should now be added:

H. vitiense (Fiji) *fl.* three to seven in an umbel. *l.* digitate; leaflets obovate-oblong, obtuse, narrowed to the petiole, entire, with horizontally spreading veins. Fiji, 1887. SYN. *Agalma vitiensis.*

HESPERALOE (from *hesperos*, Western, and *Aloe*; alluding to the aspect of the plant and its native habitat). ORD. *Liliaceæ*. A monotypic genus. The species is a very striking and interesting, greenhouse plant having a leafy stem or a very short caudex. For culture, *see* **Yucca,** on p. 227.

H. Engelmanni (Engelmann's). A synonym of *H. yuccifolia.*

H. yuccifolia (Yucca-leaved). *fl.* pale rose-coloured, fascicled at the sides of the rachis or branches of the loose racemes; perianth cylindrical, straight, the segments narrow, sub-equal; stamens six; peduncle or scape leafless, 3ft. to 4ft. high, simple or with a few straight branches. *l.* clustered, linear, channelled, rigid, the margins white-filamentose. Texas, 1882. SYN. *H. Engelmanni.*

HESPEROCALLIS (from *hesperos*, Western, and *kallos*, beauty; in allusion to the habitat of the plant, *Hemerocallis*, to which the present genus bears some resemblance, being an Eastern one). ORD. *Liliaceæ*. A monotypic genus. The species is a greenhouse or half-hardy plant, with a short, woody caudex, allied to *Hemerocallis*. For culture, *see* **Yucca,** on p. 227.

H. undulata (waved). *fl.* whitish, sweet-scented, large, shortly pedicellate, in a simple raceme; perianth funnel-shaped, the tube cylindrical, the lobes oblong-spathulate, longer than the tube, erecto-patent; stamens six; bracts under the pedicels scariose, sometimes a few leafy ones below the inflorescence; scape erect, simple. February and March. *l.* radical, linear, elongated, undulated, rather thick, broadly edged with white. California, 1882.

HEXISIA (from *exisoein*, to be equal or like; in reference to the conformity of the lip with the sepals). SYN. *Euothonæa*. ORD. *Orchideæ*. A small genus (three or four species) of epiphytal Orchids, inhabiting tropical America from Brazil to Mexico. Flowers mediocre; sepals nearly equal, narrow, the dorsal one free, the lateral ones produced in a very short chin; petals resembling the dorsal sepal; lip erect, connate with the column at base, the lateral lobes obscure, the middle one lanceolate, spreading, equalling the sepals; column short; pollen masses four; racemes terminal, few-flowered; peduncles short. Leaves narrow, rather rigid. Only one species is known in gardens. For culture, *see* **Ornithidium,** on p. 524, Vol. II.

H. bidentata (two-toothed). *fl.* bright scarlet, about ½in. in diameter; sepals and petals linear, acute; lip narrow obovate-

Hexisia—*continued.*

oblong; racemes short, arising from the nodes. *l.* linear-oblong, not longer than the joints. Stems constricted at the nodes, the joints 1in. to 1½in. long. Panama, Colombia, 1887. A pretty little Orchid.

HIBISCUS. Calyx five-cleft or five-toothed; staminal column truncate or five-toothed; ovary five-celled. To the species and varieties described on pp. 142-3, Vol. II., the following should now be added:

H. californicus (Californian). *fl.* white, with a purple centre, 2in. to 3in. long. Late summer or autumn. *l.* cordate, acuminate, rarely somewhat three-lobed, crenate or acutely toothed, 3in. to 5in. long, exceeding the petioles, velvety-pubescent when young. *h.* 5ft. to 7ft. Perennial. Island in San Joaquin River, California.

H. chrysanthus (golden-flowered). *fl.* large, campanulate; petals yellow, with a purple spot at base, broad-obovate. *l.* pale green, roundish, sub-trilobate, serrated. Stems hairy. Natal. Greenhouse shrub.

H. cisplatanus (Plane-like). *fl.* pale rose, 2½in. in diameter; calyx campanulate, surrounded by numerous linear bracts. *l.* ovate, acuminate, with a tendency to become three-lobed. Brazil, 1887. Greenhouse shrub.

H. rosa-sinensis kermesinus (carmine). *fl.* rich carmine-crimson, large; petals broad, rounded, undulated, outer ones reflexed, central ones erect, the innermost series consisting of the transformed column developed into numerous petaliferous lobes bearing stamens on their margins. South Sea Islands.

H. r.-s. magnificus (magnificent). *fl.* bright rosy-magenta, shaded crimson, the base of each petal blotched chocolate.

H. r.-s. subviolaceus (partly violet). *fl.* bright rose-colour, lightly striped with violet, dark purple at the base of the divisions, double. 1885. An ornamental variety.

HIERACIUM. To the species described on p. 143, Vol. II., the following should now be added:

H. maculatum (spotted). *fl.-heads* yellow, cymose; florets toothed. Summer and autumn. *l.* ovate-lanceolate, strongly toothed, hairy, strongly speckled with black. Stem branched, many-leaved. *h.* 1½ft.

HILLEBRANDIA (named in honour of Dr. Hillebrand, a botanist at Hawaii, who sent dried specimens of the plant to Kew in 1865). ORD. *Begoniaceæ*. A monotypic genus. The species is a tall, branched, succulent, stove herb, everywhere sparsely clothed with long, reddish hairs. For culture, *see* **Begonia,** on p. 170, Vol. I.

H. sandwicensis (Sandwich Isles). *fl.* white, tinged rose, or more or less rosy, about ½in. in diameter, the females bibracteolate; sepals five, ovate, sub-acute, the outer ones rather larger; petals five, spathulate, concave, membranous; stamens many, free; peduncles 6in. to 12in. long, dichotomously branching, and bearing bisexual cymes. May. *l.* 4in. to 8in. long and broad, obliquely rounded and deeply cordate, with a very narrow sinus, and overlapping basal lobes. *h.* 3ft. to 4ft. Sandwich Isles, 1886. (B. M. 6953.)

HIPPEASTRUM BAGNOLDI. Mr. Baker regards as a form of this species the plant described on p. 550 as **Habranthus punctatus** (which *see*).

HOLLYHOCK. New Hollyhocks have been exhibited during the year 1888 at the metropolitan exhibitions; but none of them have come up to the high quality of the best flowers produced by Lord Hawke and by Messrs. Chater, of Saffron Walden. A few good varieties omitted from the previous list are as follow:

BULLION, primrose-yellow; CZAR, rosy-red, well-formed; DAVID HENDERSON, rosy-red, fine and full; DAVID LOW, rosy-crimson, long spike; EXCELSIOR, salmon, large and full; FRANK GIB DOUGLALL, reddish-purple, large; FRED. CHATER, sulphur-yellow, perfect form; GRACE DARLING, rosy-salmon, large; HERCULES, yellow, darker base, perfect; IN MEMORIAM, purple; long spike; J. M. LINDSAY, clear red, perfect, good spike; MAJESTIC, deep red, large, long spike; MEMNON IMPROVED, crimson, large; MRS. BOLTON, pale rose, finest form; MRS. DOWNIE, bright orange, good form; MRS. EDWARDS, salmon, extra fine; MRS. LAING, rosy-lilac, large, well-formed; NETTY GRIEVE, purple, large and well-formed: PURPLE PRINCE, purple, very finely formed, large spike; QUEEN OF BUFFS, buff, well-formed, large spike; REINE BLANCHE, pure white, handsome spike; ROBERT MARTIN, crimson, large, good spike; STANDARD BEARER, creamy-white, fine spike; TECOMA, rose, large and full, good spike; THE QUEEN, flesh, with salmon-tint, full; WILLIAM FOWLER, dark crimson, fine form; WILLIAM THOM, carmine, large, tall spike.

HOMALOMENA. Flowers borne on an inappendiculate spadix, which is included in the spathe, and often

Homalomena—*continued.*

shortly stipitate, the male inflorescence cylindrical or fusiform, the female shorter and narrower; spathe straight, cylindrical or convolute below, the lamina convolute or gaping, acuminate. Leaves ovate- or triangular-cordate or lanceolate; petioles often elongated and long-sheathing. To the species described on p. 149, Vol. II., the following should now be added:

H. insignis (remarkable). *fl.*, spathe green, 3½in. to 4in. long, obtusely keeled at back, the apex compressed-rostrate; spadix white, 3in. long. *l.* 1ft. long, 6in. broad, elliptic-oblong, obtuse and shortly mucronate, rounded at base, green above, suffused purple beneath; petioles fuscous-purple, channelled, 3in. to 5in. long, sheathed to the middle. Borneo, 1885. (I. H. 1885, 560.)

H. Siesmeyerianum (Siesmeyer's). *fl.*, spathe purplish-red outside, white within, the tube and limb indistinguishable; peduncle purplish-red. *l.* slightly sagittate, the veins, midrib, and margin beneath, tinted red; petioles purplish-red, long, glabrous. Malaya, 1885.

HOULLETIA. To the species described on pp. 153-4, Vol. II., the following variety should now be added:

H. odoratissima xanthina (yellow). *fl.*, sepals and petals orange-yellow, the lip sulphur and white. 1884. A handsome variety.

HOYA. To the species described on pp. 155-6, Vol. II., the following should now be added:

H. gonolobioides (Gonolobus-like). *fl.* brownish, rotate, with ovate, obtuse lobes, umbellate; peduncles hispid. *l.* membranous, cordate-ovate, acuminate, hairy on both sides. Stem fulvous-hispid, climbing. India (?), 1884. A distinct plant.

H. Griffithii (Dr. W. Griffith's). *fl.* externally pale and rather dull rose-red, with yellowish edges, paler and yellowish within, with three faint pink stripes on each segment, 1in. to 1¼in. in diameter, numerous, umbellate on a stout peduncle 1in. to 1½in. long. July. *l.* in distant pairs, 4in. to 10in. long, very shortly petiolate, elliptic or oblong-lanceolate or oblanceolate. Stem flexuous, climbing. Eastern Bengal, 1885. (B. M. 6877.)

H. linearis sikkimensis (Sikkim). *fl.* waxy-white, pentagonally five-lobed, nearly ½in. in diameter, in terminal, ten to thirteen-flowered umbels. *l.* soft, fleshy, terete, hairy. Stems weak and flaccid, pendulous, slender, softly hairy. Sikkim, 1883. A good basket plant. (B. M. 6682; G. C. n. s., xx., pp. 8-9.)

H. longifolia Shepherdi (long-leaved, Shepherd's). *fl.* pale flesh-coloured, ½in. in diameter, disposed in globose umbels. *l.* linear-oblanceolate, acute, 5in. to 7in. long, ½in. broad. Sikkim, 1885. A beautiful plant. (G. C. n. s., xxiv., p. 616.)

HUERNIA. To the species described on p. 156, Vol. II., the following should now be added:

H. aspera (rough). *fl.* few in a sessile cyme; sepals greenish or purple, linear-subulate, spreading; corolla purple, nearly 1in. in diameter and as long, campanulate, the lobes very short, broadly triangular, acute; column very short; outer corona of five broad, short, truncate, very dark lobes, the inner of five yellowish, oblong-lanceolate, erect, incurved, obtuse ones. September. *l.* minute, tooth-like, distant, horizontal or recurved. Stems procumbent, purplish-brown; branches ascending, divaricate. Zanzibar, 1887. (B. M. 7000.)

HUMULUS. SYN. *Lupulus*. Flowers dicœcious, the males paniculate, the females spicate. Leaves opposite, petiolate, broad, five to seven-nerved. To the species described on p. 157, Vol. II., the following should now be added:

H. japonicus (Japanese). *fl.*, males in long, lax panicles; females in short, ovoid spikes, on long peduncles, with cordate, cuspidate-acuminate bracts, which do not enlarge in the fruit. *l.* palmately five to seven-lobed, the margins toothed. Japan. 1886. Somewhat like the common Hop. (R. G. 1886, p. 359, f. 43.)

HYACINTHUS. To the species and varieties described on pp. 159-60, Vol. II., the following should now be added:

H. azureus (sky-blue). *fl.*, lower ones deep blue, deflexed, with an oblong perianth ½in. long, the segments about one-third as long as the tube; upper ones nearly sessile, the sky-blue, campanulate perianth having segments nearly or quite as long as the tube; raceme dense, conical, with a thickened, blue axis; scape rather shorter than the leaves. February. *l.* six or eight, lorate, erect, glaucous, 4in. to 6in. long, deeply channelled down the face. Bulb white, about 1in. in diameter. Asia Minor. (B. M. 6822.)

H. fastigiatus (pyramidal). *fl.*, perianth bright lilac, ½in. to ¾in. long, the segments oblong-lanceolate; raceme few-flowered, in the wild state often congested into a corymb; scape erect, terete, shorter than the leaves. March and April. *l.* three to six or

Hyacinthus—*continued.*

more, subulate, weak, glabrous, 6in. long, contemporary with the flowers. Corsica and Sardinia, 1882. (B. M. 6663.)

H. lineatus (lined). *fl.*, perianth blue, campanulate, ⅛in. to ¼in. long, ascending; raceme 1in. long, six to twelve-flowered; scape 2in. to 4in. high. Spring. *l.* two, rarely three, oblong-lanceolate, acute, falcate, line-nerved, 3in. to 4in. long. Asia Minor, 1837. (R. G. 1887, p. 446, f. 114.)

VARIETIES. The importation of Hyacinths from Holland increases year by year, and the large growers there are alive to the fact that improved varieties, when they can be offered at a reasonable price, are purchased, as soon as they become known, in preference to the old ones. It is thought by some growers in England that the spikes of blossom in the bulb gardens in Holland are not nearly so perfect as they can be produced in England. This is an error: the quality of the best spikes in the leading Dutch bulb gardens is much superior to that of the best produced in English greenhouses. The growers also complain that customers do not order the new varieties, even when they are proved to be superior to the old sorts. For instance, BOUQUET TENDRE was the best double red fifty years ago: now it has been surpassed by DISRAELI in the same colour; but the trade order the inferior variety. It is the same all through.

The following selection is the result of a careful inspection of the flowers growing in the Dutch gardens, and includes the best new ones for culture in England.

Single Black. KING OF THE BLACKS, rich deep black, well-formed compact spike; MASTERPIECE, rich glossy-black, compact solid spike; SIR HY. BARKLEY, purple-black, tall spike, extra fine; UNCLE TOM, shining black, medium spike, early.

Single Blue. CZAR PETER, pale lavender-blue, large bells, massive well-formed spike, extra fine: ELECTRA, pale blue, long handsome spike of large flowers; ENCHANTRESS, porcelain-blue, large truss; GRAND MAITRE, medium blue, darker stripe, very large, immense spike; LORD BYRON, pale blue, deeper blue stripe; PRAALTOMBE, pale blue, long handsome spike; QUEEN OF THE BLUES (Kersten), pale blue, compact spike; SIR CHARLES NAPIER, blue-purple, long spike; SOUVENIR J. H. VEEN, deep purple-blue, massive spike; WILLIAM I., dark purple, long spike, early.

Single Lilac, Mauve, and Violet. CHALLENGER, claret-coloured, medium spike, very distinct; CHARLES DICKENS, reddish-lilac, sport from the blue variety of this name; DISTINCTION, dark mauve-purple, dark stripe, moderate spike; GALATEA, rosy-lilac, long spike; LORD MAYO, purplish-violet, white eye, well-formed, small spike; PRESIDENT LINCOLN, violet-purple, white eye; PYGMALION, rosy-lilac, distinct; THE SHAH, bright lilac-purple, broad spike.

Single Red and Pink. AMELIA, large and well-formed, splendid long spike; CHARLES DICKENS, a pink form of the blue variety; DUCHESS OF EDINBURGH, pale rose, long handsome spike; ETNA, rosy-red, broad handsome spike; FABIOLA, pale rose, handsome spike; GERTRUDE, rosy-red, handsome compact spike; GIGANTEA, pale rose, medium, immense spike; KING OF THE REDS, deep red, medium spike; PINK PERFECTION, clear pink, long spike; SOLFATERRE, orange-red, handsome spike; VUURBAAK, crimson, handsome long spike.

Single White. AVALANCHE, pure white, large, long spike; GLOIRE DE HAARLEM, pure white, compact spike; LADY DERBY, a pure white form of the pale blue LORD DERBY, very fine; LA FRANCHISE, creamy-white, very large; MRS. VEITCH, pale blush, large and well-formed, handsome spike; PRINCESS OF WALES, clear white, well-formed, long compact spike; ROYAL BRIDE, pure white, large, compact spike; WHITE PERFECTION, pure white, well-formed, handsome spike.

Single Yellow. CRITERION, clear yellow, well-formed, handsome spike; KING OF THE YELLOWS, pure yellow, of good substance, compact spike; OBELISQUE, clear yellow, compact spike; ORANGE ABOVE, orange-buff, medium spike; QUEEN OF THE YELLOWS, clear deep yellow, large spike.

Double Blue. CHARLES DICKENS, the best dark blue, compact handsome spike; CROWN PRINCE OF SWEDEN, dark lavender-blue, compact spike; MAGNIFICENT, dark porcelain-blue, large, fine spike; VAN SPEYK, lilac-blue, the largest bells of all Hyacinths, good spike.

Double Red. ANNETJE, reddish-pink, semi-double, long handsome spike, extra fine; DISRAELI, a greatly improved BOUQUET TENDRE; PRINCE OF ORANGE, bright pink, dark stripe; PRINCESS DAGMAR, deep red, carmine stripe, good spike; PRINCESS LOUISE, dark red, very double, massive compact spike; REGINA VICTORIA, rosy-pink, compact spike; VENUS DE MEDICIS, rose, well-formed, long spike.

Double Lilac. LA VICTOIRE, lilac-purple, perfectly double, long spike.

Hyacinthus—*continued.*

Double White. FLORENCE NIGHTINGALE, pure white, semi-double, good spike; LORD DERBY, pure white, quite double, good spike.

Double Blush. BLUSH PERFECTION, rosy-blush, semi-double, handsome spike.

Double Yellow. CRŒSUS, orange-yellow, large; HEROINE, clear yellow, tipped green.

HYDRANGEA. To the varieties of *H. hortensis* described on pp. 162-3, Vol. II., the following should now be added:

H. hortensis rosea (rosy). *fl.* of a brilliant, deep rose-pink, large, in medium-sized, globular heads. 1883. A fine decorative plant.

HYDROGLOSSUM SCANDENS FULCHERI. A synonym of **Lygodium scandens Fulcheri** (which *see*).

HYDROSME. Included under **Amorphophallus** (which *see*).

HYMENOCALLIS. To the species described on pp. 164-5, Vol. II., the following should now be added:

H. eucharidifolia (Eucharis-like). *fl.*, perianth with a green, slender tube 4in. long; segments linear, deeply channelled down the face, 3in. to 3½in. long; corona white, funnel-shaped, 1¼in. long; umbel four or five-flowered; scape ancipitous, 1ft. long. Summer. *l.* four, thin, bright green, oblong, 1ft. long, nearly sessile. Tropical America, 1884.

HYMENOSPORUM (from *hymen*, a membrane, and *sporos*, seed; the seeds are girded by membranous wings). ORD. *Pittosporeæ*. A monotypic genus. The species is a greenhouse, evergreen tree, with the habit of **Pittosporum** (which *see*, on p. 153, Vol. III., for culture).

H. flavum (yellow). *fl.* yellow, marked orange-red at the mouth of the tube, showy, in a loose, terminal panicle; sepals distinct; petals connivent in a tube above the middle or sub-coherent, and, as well as the numerous stamens and the ovary, silky-tomentose. April. *l.* entire, glabrous, broadly obovate-lanceolate, the uppermost ones often somewhat whorled. Eastern Australia. SYN. *Pittosporum flavum* (B. M. 4799).

HYPERICUM. To the species described on pp. 168-9, Vol. II., the following should now be added:

H. aureum (golden). *fl.* large, nearly solitary and sessile; petals orange-yellow, coriaceous, reflexed, longer than the ovate, unequal sepals and the excessively numerous stamens. Summer. *l.* oblong, obtuse, attenuate, glaucous beneath, minutely undulate-crisped on the margin, somewhat coriaceous. *h.* 2ft. to 4ft. Southern United States. Habit dense and compact.

HYPOLEPIS SPECTABILIS. A synonym of **Cheilanthes chlorophylla** (which *see*).

HYPOXIS. Of this genus fifty-one species have been enumerated; they are found in tropical Asia, Australia, the Mascarene Islands, tropical and South Africa, and tropical and North America. Perianth tube none, the segments six, sub-equal, spreading; stamens six; ovary three-celled. To the species described on p. 171, Vol. II., the following should now be added:

H. colchicifolia (Colchicum-leaved) *fl.*, perianth 1¼in. in diameter, the segments bright yellow inside, greenish-yellow and slightly hairy on the back, oblong-lanceolate; peduncle slender, three or four-flowered. Autumn. *l.* in a tuft about 1ft. high; produced ones six to eight, oblong or oblong-lanceolate, the largest 6in. to 8in. long, 1½in. to 2in. broad, glabrous. Corm globose, 2in. in diameter. Cape of Good Hope, 1884.

ILLICIUM. To the species described on p. 177, Vol. II., the following should now be added:

I. verum (true). *fl.* red, axillary, shortly pedunculate, globose; perianth leaflets about ten, orbicular, concave. November. *l.* elliptic-lanceolate or oblanceolate, obtuse or obtusely acuminate, shortly narrowed into the petioles. *h.* 9ft. South China, 1883. (B. M. 7005.)

IMANTOPHYLLUM. To the species described on p. 178, Vol. II., the following varieties should now be added:

I. miniatum aurantiacum (orange), *fl.* bright yellowish-salmon, 3in. in diameter; umbels large. 1886. Garden seedling.

I. m. cruentum (bloody). *fl.* bright orange-scarlet, of fine form and substance. Spring.

IMPATIENS. To the species described on pp. 179-80, Vol. II., the following should now be added. They require stove treatment.

Impatiens—*continued.*

showy, axillary, solitary or corymbose; claws of the segments white, marked blue; sepals and petals broad, the dorsal sepal rounded, the lateral lobes oblong; spur réd, recurved. Summer.

FIG. 29. PORTION OF FLOWERING BRANCH OF IMPATIENS HAWKERI.

I. comorensis (Comoro Islands). *fl.* bright carmine, large, with a white, bifid spur. *l.* elliptic-lanceolate, acute, crenate. Comoro Islands, 1887. A pretty plant, of vigorous growth.

I. cuspidata (cuspidate) *fl.* rosy, solitary in the axils of the leaves, having a long, filiform spur *l.* lanceolate, acuminate, serrated. Stems glaucous. Birma, 1884.

I. Hawkeri (Lieut. Hawker's). *fl.* brownish-red, large, very *l.* glabrous, shortly petiolate, 4½in. long, 2in. broad, opposite or ternate, very acutely serrated, ovate-elliptic, acuminate. Sunda Islands, 1886. A branched herb. See Fig. 29, for which we are indebted to Mr. Wm. Bull. (I. H. ser. v. 2.)

I. Sultani Episcopi (Bishop Hannington's). *fl.* rich purple carmine, shot with a brilliant rosy hue. Zanzibar, 1886. A perpetual-flowering variety.

IPOMŒA. To the species described on pp. 191-2, Vol. II., the following should now be added:

I. Horsfalliæ alba (white). A synonym of *I. Thomsoniana.*

I. Robertsii (G. F. Roberts'). *fl.*, sepals ¼in. to ½in. long; corolla nearly white externally, with pale pink stripes, 3in. to 4in. long, the limb internally white, obscurely striated with pale pink, and with five lanceolate, rosy-pink rays; peduncles one-flowered. July. *l.* 3in. to 4in. long, membranous, broadly ovate-cordate, acuminate, dull green, pubescent; petioles 1½in. to 2in. long, pubescent. Queensland, 1883. Stove, twining perennial. (B. M. 6952.)

I. Thomsoniana (Thomson's). *fl.* white, 3in. in diameter; cymes axillary, few-flowered. *l.* trifoliolate; leaflets stalked, elliptic or elliptic-oblong, acute, fleshy. 1884. A handsome, stove climber, with the general habit of *I. Horsfalliæ.* (F. & P. 1884, p. 118; G. C. n. s., xx., p. 818.) SYN. *I. Horsfalliæ alba.*

IRESINE. To the species described on p. 193, Vol. II., the following should now be added:

I. formosa (beautiful). *l.* golden, veined with crimson and pencilled with green. 1883. A very effective sport from *I. Lindenii;* it keeps its character well out of doors, and makes an excellent bedding plant.

IRIS. To the species described on pp. 194-200, Vol. II., the following should now be added:

Sect. I. Irises proper.

I. Alberti (Dr. Albert Regel's). *fl.* bright lilac; tube less than 1in. long; falls obovate-cuneate, 2in. long, densely bearded, and veined dull brown and lilac on a white ground; standards above 1in. broad, suddenly narrowed to a convolute claw; panicle lax, overtopping the leaves. May. *l.* ensiform, 1½ft. to 2ft. long, slightly glaucescent. Rootstock stout. Turkestan. (B. M. 7020.)

I. arenaria minor (lesser). A dwarf variety, having much smaller flowers than those of the type.

I. Bartoni (Col. Barton's). *fl.* two or three in a cluster, strongly scented; perianth tube greenish, 1in. long; falls creamy-white, veined greenish-yellow on the face, violet purple on the claw, the beard white and orange; standards creamy-white, veined purple. June. *l.* ensiform, pale green, 1½ft. long, 1½in. to 2in. broad, strongly ribbed. Stem usually once-forked. Afghanistan, 1886. (B. M. 6869.)

I. Biliotti (Biliotti's). *fl.* sweet-scented; falls reddish-purple, with fine, blackish veins, bearded, 3½in. long, 1½in. broad, cuneate-spathulate; standards bluish-purple, with fine blue veins, 3½in. long, 2in. broad, connivent; styles white, ovate, with triangular, reddish-purple crests. Stem 2½ft. to 3ft. high. Siwas, Asia Minor, 1887. Habit as *I. germanica.*

I. cengialti (Monte Cengialto). *fl.* sky-blue, flushed violet; perianth tube, as well as the segments, short and broad, the beard white, tipped orange, short and dense, with thick, stunted hairs; scape about 1ft. high, usually four-flowered. May and June. *l.* yellowish-green, 6in. to 9in. long and ½in. broad, or more. Monte Cengialto. There are several varieties of this plant.

I. Duthieii (Duthie's). *fl.* solitary, sessile; tube 3in. long or more; falls reddish-lilac with darker veins and blotches above, greenish-yellow beneath, nearly horizontal, lanceolate, bearded; standards paler reddish-lilac, with darker veins, connivent, ½in. long, oblong-ovate; styles light reddish-lilac, with triangular, crenate crests. *l.* appearing after the flowers, five or six to a tuft, 2ft. long, ½in. broad, yellowish-green. Rhizome knotted. Kumaon, 1887.

I. Eulefeldi (Eulefeld's). *fl.* two to a stem; perianth tube reddish-purple; falls purple, with a long, white and bluish-purple beard; standards purple and reddish-purple, the claw yellowish. May. *l.* five or six, 1ft. long or more, more or less falcate, acute, remarkably glaucous. Stem 1ft. high, with a bract or sheathing leaf about half-way up. Eastern Turkestan, 1886. (B. M. 6902; R. G. 954.)

I. germanica Siwas (Siwas). *fl.*, falls dark indigo-purple; standards dark bluish-purple. Siwas, Asia Minor, 1887.

I. Hookeriana (Hooker's). *fl.* two to a stem; tube ½in. to ¾in. long; falls bluish-purple with darker blotches above, green with purple borders beneath, obovate-lanceolate, 1⅜in. long, ⅝in. broad, reflexed, densely bearded; standards bluish-purple, narrow-obovate, ⅜in. long, ½in. broad; styles reddish-purple, very concave, with triangular, serrated, revolute crests. *l.* 1ft. long, ⅜in. to 1in. broad, appearing with the flowers. Stem about 5in. long. Lahul, 1887.

I. Korolkowi concolor (concolorous). A fine variety, with almost concolorous, bright lilac-purple flowers. (B. M. 7025 B.)

I. lineata (lined). *fl.* yellow and greenish-yellow, striated with fuscous-red; standards 2½in. long, erect, lanceolate, acute; falls narrow-lanceolate, acuminate, recurved; spathe herbaceous, three-leaved; scape two-flowered. *l.* four to six, ligulate-ensiform, erect, attenuate-acute, about equalling the scape. Caucasus, 1887. (R. G. 1244, f. 1-6.)

Iris—*continued.*

I. lupina (wolf's). *fl.* solitary; tube about 2in. long; falls greenish-yellow, veined brownish-red towards the margins, 3in. long, 1⅜in. broad, broadly lanceolate, reflexed, serrated, bearded; standards the same colours, 3⅜in. long, 2½in. broad, elliptic, connivent, crenate, bearded; styles yellow, with brownish-red veins and dots, much recurved, with rounded crests. *l.* 9in. long or more, ⅜in. broad. Stem 6in. high. Kharput, 1887.

I. Kingiana (King's). *fl.*, perianth tube greenish, cylindrical, 2in. to 2½in. long; falls dark lilac, mottled paler lilac, obovate-cuneate, with a white and yellow beard; standards paler lilac, unguiculate, erect; spathes single-flowered; peduncle very short. May. *l.* five or six in a rosette, three of them elongated, linear, erect, about 6in. long at flowering time. Central Himalayas, 1887. (B. M. 6957.)

I. Milesii (Miles'). *fl.* bright lilac, fugitive, inodorous, three or four in a cluster; perianth tube cylindrical, the limb about 2in. long; falls having darker lilac lines radiating from the yellow keel; standards shorter than the falls. May. *l.* seven or eight, distichous, ensiform, pale green, 1½ft. to 2ft. long, 1½in. broad, gradually tapering. Stem 3ft. long, bearing three or four clusters of flowers. Temperate Himalayas, 1886. (B. M. 6889.)

I. Rosenbachiana (Rosenbach's). *fl.*, outer perianth segments spreading or reflexed, emarginately bilobed at apex; claws of the standards erect, striped with yellow, 1½in. long, the lamina obovate, striped orange, dark purple above; style very long, with three terminal branches, petaloid; spathes two-leaved, one-flowered. *l.* three to five, linear-lanceolate, acute. Bulb ovate, one to three-flowered. Turkestan, 1886. There are two varieties.

I. R. cœrulea (blue). *fl.* pale violet within; standards and style dark violet at apex. (R. G. 1227 a.)

I. R. violacea (violet). *fl.* purplish-violet within; standards and style dark purplish-violet at apex. (R. G. 1227 b.)

I. Sari lurida (Sari, lurid). *fl.*, perianth tube 2in. long, the segments 2½in. to 3in. long; falls darker than the standards, with a diffused, brownish-black beard; standards violet purple, striped and spotted with darker purple; peduncle one-flowered, 6in. long. May. *l.* about six, ensiform, falcate, glaucescent, 6in. long, ½in. broad. Asia Minor, 1887. (B. M. 6960.)

I. Statellæ (Marquis Statella's). *fl.* pale yellowish, veined green, bearded yellow on the broadly cuneate-obovate, revolute falls; standards broadly oblong, obtuse, over-arching the bifid styles. *l.* ensiform, 6in. to 9in. long, glaucous-green. Stem 1ft. high, two-flowered at apex. South Europe, 1886. Allied to *I. lutescens.* (B. M. 6894.)

I. Suworowi (Suworow's). *fl.* hyaline-greenish, with olivaceous-bluish veins; segments all elliptic-lanceolate, cuspidate, the falls bearded to the middle with blue. *l.* ensiform. Stem two-flowered, as long as the leaves. Buchara, 1886.

I. vaga (wandering). *fl.* yellowish, purple, and fuscous-red; standards broadly lanceolate, acute, erect; falls obovate-spathulate, with a bluish-white beard; spathe herbaceous, four-leaved, purplish at apex; scape three-flowered. *l.* ligulate-ensiform, acute, erect, slender. Rhizome stoloniferous. 1887. (R. G. 1244, f. 7.)

I. Van Houttei (Van Houtte's). *fl.* marked with reticulate veins of a dark brown or black. April. 1882. A handsome and distinct hybrid, said to have been raised between *I. susiana* and *I. iberica*, and to be more akin to the former, having more resemblance to it in the markings.

Sect. II. Xiphions.

I. Boissieri (Boissier's). *fl.* blue-purple and red-purple. This is closely allied to *I. filifolia*, "but differs in having a very distinct tube above the ovary, in having broader and more obovate inner perianth segments, in the claw of the outer perianth segment being long and narrow, and furnished with a very distinct beard which stretches far on into the lamina" (M. Foster).

I. reticulata sophenensis (Sophene). A variety with light reddish-purple falls and reddish-lilac standards. Kharput, 1885.

I. Vartani (Dr. Vartan's). *fl.*, perianth tube nearly white, 2½in. long, the limb pale slaty-lilac; falls oblong-spathulate, ½in. broad, copiously veined lilac on a paler ground, with a yellow, carinal crest; standards erect, ½in. broad; peduncle very short. October to December. *l.*, produced ones usually two, 8in. to 12in long, dark green. Palestine. (B. M. 6942.)

ISOTOMA. To the species described on pp. 202-3, Vol. II., the following should now be added:

I. petræa (rock-loving). *fl.*, white, verging to flesh-colour, 1½in. long, the segments horizontal or reflexed, the three lower ones yellowish at their junction. *l.* lanceolate or ovate-lanceolate, acuminate, unequally laciniate. Stems branched, often 1ft. long and many-flowered. Flinders Range. Plant highly glabrous.

IXORA. To the species described on pp. 204-5, Vol. II., the following varieties, &c., should now be added:

I. conspicua (conspicuous). A handsome form, with large trusses of buff-yellow flowers, changing to bright orange. 1886.

Ixora—*continued.*

I. eminens (eminent). *fl.* at first clear buff, afterwards changing to light salmon-pink, large. 1885.

I. Findlayana (Findlay's). *fl.* white, very fragrant. East Indies, 1883. Shrub of free growth and short, stocky habit.

I. gemma (gem). *fl.* rich orange-yellow, borne in large, compact trusses. 1885.

I. illustris (brilliant). *fl.* of a bright orange-salmon colour, produced in large trusses.

I. insignis (remarkable). *fl.* deep rosy-crimson, shaded orange, disposed in a compact truss. Habit dwarf.

I. Morsei (Morse's). *fl.* bright orange, sometimes shaded with scarlet; trusses large and well-formed. 1884.

I. ornata (adorned). A variety producing a profusion of flowers of a bright orange-salmon colour.

I. speciosa (showy). *fl.* buff, changing to orange-salmon. 1886.

I. splendida (splendid). *fl.* brilliant orange-crimson, in large corymbs. 1883. (I. H. 463.)

I. venusta (charming). *fl.* at first bright orange, afterwards becoming salmon-buff, large.

I. Westii (West's). *fl.* pale rose, becoming bright rose with age, disposed in large, sub-globose trusses, 4in. to 6in. in diameter. 1882. Hybrid.

JACOBINIA. To the species described on p. 206, Vol. II., the following should now be added:

J. Mohintli (Mohintli). *fl.* orange-yellow, axillary; corolla bilabiate, the elongated tube inflated above, the upper lip slightly arched, the lower one curved in a spiral and three-toothed at apex. *l.* opposite, elongate-ovate, entire, coriaceous. Mexico, 1886. A half-hardy under-shrub, of bushy habit. SYN. *Sericographis Mohintli.*

JASMINUM. To the species described on pp. 207-8, Vol. II., the following should now be added:

J. angulare (angular-stemmed). *fl.* white, disposed in terminal cymes; calyx teeth short, ovate, acute; corolla tube 1in. to 1½in. long, the limb of five or six spreading, lanceolate lobes. *l.* trifoliolate. Stems angular. South Africa, 1886. An ornamental, scrambling, greenhouse shrub. (B. M. 6865.)

JUSTICIA. To the species described on p. 214, Vol. II., the following should now be added:

J. campylostemon (curved-stamened). *fl.* white, small, with some purple spots on the disk of the middle lobe of the lower lip; free portion of the stamens curved inwards; peduncles axillary, mostly shorter than the leaves, one to several-flowered. Winter. *l.* ovate or ovate-lanceolate, acuminate, bright green, glabrous except on the nerves beneath. *h.* 2ft. Natal, 1883.

KÆMPFERIA. To the species described on p. 214, Vol. II., the following should now be added:

K. atrovirens (dark green). *fl.* violet-purple, 1½in. in diameter, the lip spotted yellowish at base; spike few-flowered, shortly exserted from the sheath. *l.* 2in. to 5in. long, 1½in. to 2in. broad, obliquely elliptic-oblong, acute, dark green above, rather paler towards the margins, more or less suffused with purple beneath; petioles 4in. to 5in. long, channelled, sheathing at base. *h.* 9in. Borneo, 1886. (I. H. 1886, 610.)

K. secunda (side-flowering). *fl.*, calyx tubular, slender, split above; corolla tube reddish, nearly 1in. long, very slender, curved, the lobes elliptic-oblong, acuminate; lateral staminodes broadly oblong or rounded, spreading, rather reflexed; lip rounded, shortly bifid or notched at end; spike terminal, few-cleft. September. *fr.* three to four lines long, ovoid, many-seeded. *l.* 3in. to 3½in. long, the lower ones smaller, membranous, obliquely lanceolate, caudate-acuminate. Assam and Khasia Mountains, 1887. (B. M. 6999.)

KALANCHOE. To the species described on p. 216, Vol. II., the following should now be added:

K. carnea (flesh-coloured). *fl.* pink, fragrant, ½in. in diameter, disposed in corymbose cymes. *l.* fleshy, petiolate, elliptic-ovate, obtuse, crenate, brownish-green, 3in. to 5½in. long, 1½in. to 3in. broad. Stem, when old, forming a large bole. South Africa, 1886. An attractive, greenhouse, glabrous succulent.

KALMIA. To the species described on p. 216, Vol. II., the following variety should now be added:

K. latifolia myrtifolia (Myrtle-leaved). A dwarf, garden form. 1883. SYN. *K. myrtifolia* (R. H. 1883, p. 10).

K. myrtifolia (Myrtle-leaved). A form of *K. latifolia.*

KARATAS. To the species described on pp. 216-7, Vol. II., the following should now be added:

K. acanthocrater (strong-spined). *fl.* purplish or bluish, in a dense head in the centre of the leaves. *l.* forming a dense rosette, spreading, obtuse, with spiny margins, dark green above, greyish-banded beneath; inner ones brownish-spotted. Brazil, 1885. A large species, 2½ft. to 3ft. in diameter. SYN. *Nidularium acanthocrater* (B. H. 1884, 9).

K. amazonica (Amazons). *fl.* white, with a greenish tube, disposed in a dense, sessile head in the centre of the rosette; bracts greenish-brown. *l.* rosulate, 1ft. to 1½ft. long, 2in. to 3in. broad, greenish-brown on the face, glossy claret-brown on the back, without markings or scales, the margins finely serrated. Amazons, 1886. SYNS. *Æchmea amazonica, Bromelia amazonica.*

K. ampullacea (pitcher-like). *fl.* about twelve in a head; sepals and bracts green; corolla blue, white at the throat. *l.* few, short, obtuse, acuminate, green, spotted with reddish-brown, especially beneath. Brazil, 1881. A distinct and pretty species, producing numerous suckers; it is remarkable for the manner in which the long sheaths of the leaves are collected into a sort of ovoid pitcher. SYN. *Nidularium ampullaceum* (B. H. 1885, 14).

K. Johannis (Johanni Sallier's). *fl.* white, small; inflorescence immersed in the centre of the leaves. *l.* spreading, about 1½ft. long, obtuse and channelled down the face, very pale green, slightly marbled, reddish at the apex, the margins armed with fine, distant spines. Brazil, 1885. Habit vigorous.

K. Makoyana (Makoy's). *fl.*, petals whitish, slightly violet towards the acuminate tips, free to the base; bracts green, narrow, linear-lanceolate. *l.* green on both sides, but obscurely white-banded beneath. Otherwise like *K. spectabilis.* Tropical America, 1887. SYN. *Nidularium Makoyanum.*

K. rutilans (ruddy). *fl.* vermilion-red, disposed in a contracted panicle nestling among the bract-leaves, which are of a beautiful red, shaded with rose. *l.* smooth, spotted dark green. Brazil, 1885. SYN. *Nidularium rutilans.*

K. striata (striated). *l.* 8in. to 12in. long, bright green, striped or striated with a central white variegation, deepening off to creamy-yellow, the margins freely furnished with small, spinose teeth. Brazil, 1888. SYN. *Nidularium striatum.*

KENTIA AUSTRALIS. A synonym of **Howea Belmoreana** (which *see*, on p. 155, Vol. II.).

KERCHOVEA. Included under *Stromanthe.* The plant described as *K. floribunda* is identical with **S. Porteana** (which *see*, on p. 519, Vol. III.).

KNIPHOFIA. To the species described on pp. 219-20, Vol. II., the following should now be added:

K. Kirkii (Sir John Kirk's). *fl.* in a dense raceme; perianth reddish-orange, sub-cylindrical, sixteen to seventeen lines long, ¼in. in diameter in the upper half; peduncle 4ft. long, bearing two large bract-leaves. Winter. *l.* ensiform, 5ft. to 6ft. long, 1½in. broad low down, gradually tapering to a long point, acutely keeled. South-eastern tropical Africa, 1887. Perhaps hardy.

K. pallidiflora (pale-flowered). *fl.*, perianth white, rather more than ½in. long and ¼in. in diameter, somewhat funnel-shaped, with short, obtuse lobes; raceme at first short and dense, but elongating and becoming lax as the flowers open; stem terete, 1ft. to 2ft. high. Autumn. *l.* 6in. to 12in long, one line broad, semi-terete, minutely serrulated. Ankaratra Mountains, Central Madagascar, 1887. Half-hardy.

KOPSIA. To the species described on p. 222, Vol. II., the following should now be added:

K. ornata (ornamental). *fl.* white, with a red centre, salver-shaped, disposed in corymbose panicles. *l.* large, oblong-lanceolate, glossy green. Ceram, 1884. A handsome shrub.

LABISIA. To the species described on p. 223, Vol. II., the following should now be added:

L. alata (winged). *fl.* white within, flesh-coloured outside, small; thyrse spike-formed, axillary, 4in. to 6in. long; peduncle minutely rusty-scurfy. *l.* alternate, sessile, 6in. to 12in. long, 3in. to 4in. broad, lanceolate, obtuse, acuminate, long-attenuated at base, the margins slightly crenulate, the upper surface calcareous-green. *h.* 1ft. Borneo, Sumatra, and Malacca, 1886. (I. H. 1886, 605.)

L. Malouiana (Malou's). *l.* sub-sessile, 8in. to 10in. long, 2¾in. to 3¾in. broad, lanceolate, acuminate, velvety, dark green, irregularly marked pale green down the middle, red and purple when young; petioles very short, sheathing at base. Stem short, erect, warted, slightly copper-coloured, spotted white. Borneo, 1885. (I. H. 1885, 580.)

LABURNUM. To the species and varieties described on p. 224, Vol. II., the following should now be added:

Laburnum—*continued.*

L. Alschingeri (Alschinger's). *fl.* of a paler yellow than in the common species, freely produced, some of the racemes measuring 1½ft. in length. Croatia. Very floriferous. It is doubtful whether the plant generally cultivated under this name is the true *L. Alschingeri.*

LACHENALIA. To the species and hybrids described on p. 225, Vol. II., the following should now be added:

L. aureo-reflexa (hybrid). *fl.* bright yellow, the outer segments slightly tinged green, fading to reddish-brown; perianth oblong-triangular, 1in. to 1½in. long; raceme 4in. to 6in. long, eight to twelve-flowered. April. *l.* two, bright green, fleshy, unspotted, lanceolate, recurved, 6in. to 8in. long. 1887. A hybrid between *L. tricolor lutea* (SYN. *L. aurea*) and *L. reflexa.*

L. reflexa (reflexed). *fl.*, perianth bright yellow, tipped green, the segments being of unequal length. *l.* in pairs, recurved, 6in. to 8in. long, 1in. broad, dark green, channelled, the tissue thickening towards the tip, which becomes almost horny. 1883.

L. tigrina Warei (tiger-marked, Ware's). *fl.* ten to twelve in a dense raceme; perianth 1½in. long, the outer segments bright red at base, bright yellow in the middle, tipped green, the inner ones greenish-yellow, with a reddish-brown margin; scape mottled reddish-brown. *l.* two, oblong-lanceolate, 4in. to 5in. long, dark-spotted. 1884. This has proved—after having been described under above name—to be a variety of *L. tricolor.*

LACHNAGROSTIS. A synonym of **Deyeuxia** (which *see*).

LÆLIA. The following corrections of, and additions to, the information given on pp. 227-30, Vol. II., are based upon the monograph of the genus recently published by Messrs. James Veitch and Sons, in Part II. of their "Manual of Orchidaceous Plants." Several species formerly included under *Brassavola* are now referred to this genus.

L. acuminata. The correct name of this species is *L. rubescens.*

L. albida bella (beautiful). A synonym of *L. a. rosea.*

L. a. salmonea (salmon-coloured). *fl.* having salmon-red sepals and petals.

L. a. Stobarti (Stobart's). *fl.*, sepals and petals tipped rose-purple; anterior lobe of the lip bright purple.

L. a. sulphurea (sulphur-coloured). *fl.* pale sulphur-yellow, having a light mauve hue on each side of the front lobe of the lip and dark purple marks at its base. 1884. A striking variety.

L. amanda (lovely). *fl.* in pairs; sepals and the broader petals light rose, with a greyish hue outside, ligulate, wavy; anterior lacinia of the lip and lateral angles rich, dark purple, the sides of the lateral laciniæ light purple, the isthmus exceedingly short; column pink, white, and dark purple. *l.* cuneate-ligulate, tinted red beneath when young. Brazil, 1882. Probably a natural hybrid.

L. Amesiana (Hon. F. L. Ames'). *fl.* 5in. to 6in. in diameter; sepals white, with a faint flush of amethyst-purple; lateral lobes of the lip white at the margin, changing to pale sulphur-yellow below, the middle lobe rich purple, which colour is continued into the tube formed by the lateral lobes, the margin crisped, whitish. A beautiful hybrid between *L. crispa* and *Cattleya maxima.* SYN. *Cattleya Amesiana.*

L. anceps blanda (pleasant). *fl.*, sepals and petals white, with a rosy hue, the middle nerve of the sepals light green; front lobe of the lip warm purple, the angles of the side lobes rosy, with purple dots, the middle area pale yellow, with numerous dark purplish-brown, elevated stripes. 1885.

L. a. grandiflora (large-flowered). *fl.* highly coloured, large, of good substance. Mexico. Plant stronger than the type.

L. a. Kienastiana (Kienast-Zölly's). *fl.*, sepals white; petals and side lobes of the lip rosy; otherwise like those of *L. a. Dawsonii.* 1886.

L. a. leucosticta (white-spotted). A variety with white or whitish-pink markings on the darker rosy sepals and petals.

L. a. munda (beautiful). *fl.*, lip having white side lobes, marked with purple veins, the yellow confined to three keels. 1886.

L. a. obscura (obscure). *fl.*, sepals and petals very dark, the former long and narrow, with a white area at base; lip dark purple, with a deep orange disk. 1886.

L. a. Percivaliana (Percival's). *fl.*, sepals and petals palest rose-purple, suffused white; lateral angles of the lip warm mauve-purple, the anterior portion purple-magenta only at the extreme anterior third, the posterior two-thirds white; disk light orange, the tips of the three crests sulphur-yellow, the disk having some purple lines over the nerves. Mexico. (R. i. 36; W. O. A. vi. 266.)

L. a. Sanderiana (Sander's). A trifling form of *L. a. Dawsonii*; the transverse purple zone on the lip is divided into two blotches by a white area. 1885.

Lælia—*continued.*

L. a. Schrœderæ (Baroness von Schrœder's). *fl.*, sepals and petals satiny-rose, the latter tipped purple; disk of the lip orange-red, with a yellow blotch on each side, the side lobes bordered with purple, the anterior one with maroon-purple.

L. a. Schrœderiana (Baron von Schrœder's). *fl.* white, with an orange disk to the lip and some crimson-purple radiating lines upon it. 1885.

L. a. Stella (star-like). *fl.* very large; sepals and petals white, stellate; side laciniæ of the lip remarkably curved, porrect, and angled, the middle lacinia long, narrow at base, dilated and often emarginate at the top, part of the base, and the disk, orange. 1887. (G. C. ser. iii., vol. i., p. 280.)

L. a. Veitchiana (Veitch's). *fl.*, sepals and petals white; disk of the lip bright yellow, with brown veins, the angles of the side lobes and front part of the middle lobe purple-mauve with darker stripes. 1883.

L. a. virginalis (virgin-white). A synonym of *L. a. alba.*

L. a. Williamsii (Williams'). *fl.* white, the lip having a yellow disk, and a yellow throat distinctly striped deep crimson-purple. Winter. Mexico. (W. O. A. iv. 190.)

L. autumnalis venusta (charming). *fl.* of a nearly uniform rosy-mauve, large. (Gn. xxv. 438.)

L. a. xanthotropis (yellow-keeled). *fl.* rosy-purple, borne in drooping racemes, the tips of the sepals and petals and the front lobe of the lip darker purple, the keels yellow. *l.* shorter and broader than in the type, rigid, leathery. 1887. (R. i. 10.)

L. bella (beautiful). *fl.*, sepals and petals light lilac, the latter broad; lip with blunt angles and a broad, anterior, wavy lobe of warm purple, as well as the side angles, two oblong, ascending, ochre-white zones at the base, and two similarly-coloured spots before the middle, the disk light purple; column white and light purple. 1884. A hybrid between *L. purpurata* and *Cattleya labiata.* SYN. *Lælio-Cattleya bella.*

L. Boothiana (Booth's). A synonym of *L. lobata.*

L. Canhamiana (Canham's). *fl.*, sepals and petals white; lip large, magenta-purple, edged with white, and having an orange throat veined with reddish-brown. 1885. A beautiful hybrid.

L. cinnabarina. *L. crispilabia* is now regarded as a variety of this species.

L. Crawshayana (De B. Crawshay's). *fl.* two; sepals and petals amethyst; lip opened near the slender column, with antrorse side laciniæ and a cuneate, abruptly blunt, middle lacinia, the tips of the side laciniæ and most of the middle one purple, the disk with a yellow mid-line, and marked purple; column greenish-white outside, white in front; peduncle long. *l.* one or two, nearly as in *L. albida.* 1883. Probably a natural hybrid.

L. crispa. The correct name of the species described on p. 281, Vol. I., as *Cattleya crispa.*

L. c. Buchananiana (Buchanan's). *fl.* large, crisp-edged; sepals and petals blush-white; lip yellow in the throat, with purplish-crimson veins, the frill of the side lobes white, with two crimson-purple spots, the front lobe crimson-purple. Brazil, 1833. A handsome, free-flowering form. SYN. *Cattleya crispa Buchananiana* (W. O. A. ii. 81).

L. c. delicatissima (very delicate). *fl.* pure white, with a few very faint rose markings on the lip. July and August. Brazil.

L. c. purpurea (purple). *fl.* very large; sepals and petals white, with a blush tinge; lip broad and blunt, with deep purple blotches breaking into radiating lines towards the margin. Brazil. (W. S. O. ii. 9.)

L. crispilabia. This is now regarded as a variety of *L. cinnabarina.*

L. Dayana. This is now regarded as a variety of *L. pumila.*

L. Digbyana (Digby's). The correct name of the plant described on p. 209, Vol. I., as *Brassavola Digbyana.* (B. R. 1846, 53; F. d. S. 1847, 257; W. O. A. vi. 241.)

L. Dominiana rosea (rosy). *fl.*, sepals and petals rose-tinted, or "like claret freely diluted with water," the petals broader and undulated; lip of a deep, velvety ruby-crimson, large and flat. 1884. A charming hybrid.

L. elegans Bluntii (Blunt's). *fl.*, sepals and petals rosy-magenta; front part of the lip magenta-crimson, much lengthened out, the basal part white, save at the two upturned points, which are flushed magenta-crimson. August and September. Brazil.

L. e. Brysiana (Brys'). *fl.*, sepals and petals rose-tinted; lip rich violet-carmine; throat white. Brazil, 1857. (I. H. 1857, 134.)

L. e. incantans (enchanting). *fl.*, sepals and petals dark nankeen, suffused purple at the edges, long and rather broad; lip nearly as in *L. e. Boutteana*, but with antrorse side laciniæ, the mid-lacinia and tops of the side ones very dark purple, the intervening disk reddish, the rest white, suffused sulphur. 1887.

L. e. intricata (intricate). "The flower makes one think of those of *Cattleya intermedia*, the narrow sepals and petals being lightest white-rose; the lip is that of *Lælia elegans picta*, only that the sharp-angled, long side laciniæ are white, the free blade

Lælia—*continued.*

of the mid-lacinia with abrupt stalk, of the deepest warm purple" (Reichenbach). SYN. *Cattleya intricata.*

L. e. irrorata (bedewed). *fl.* about 5in. across, racemose; sepals and petals blush-white, the former ligulate, acute, the latter cuneate-oblong; lateral lobes of the lip blush-white, the ends tipped rose, the middle lobe crimson, shaded purple. June and July. *l.* two or three. Stems usually 1½ft. high. Brazil. SYNS. *L. irrorata, Bletia irrorata* (R. X. O. ii. 115, f. 1). In the form *Gaskelliana* the sepals and petals are pale lilac; the lip has a white mid-area between the lateral laciniæ, the tips of the angle and mid-line lilac, the anterior lacinia warm purple, with darker markings. In *Scottiana* the sepals and petals are light rose, the middle lobe of the lip is crimson-magenta, and the throat white.

L. e. Measuresiana (Measures'). *fl.* sepals sulphur, washed outside with brownish-purple; petals sulphur, bordered purple at the top; middle lacinia of the lip dark purple, broad, the disk between the triangular side laciniæ purple, the side areas white, the top of the angles purple; column white, marked purple. 1887. (W. O. A. 207.)

L. e. platychila (broad-lipped). *fl.*, sepals and petals without any green, narrow; lip remarkably broad. 1885.

L. e. Schilleriana (Schiller's). *fl.*, sepals and petals white, elongate-lanceolate; lip three-lobed, the throat radiately veined purple, the disk sulphur-yellow, with a large, purplish-crimson blotch in front. May and June. *l.* 9in. long. Stems 1½ft. high. Brazil. SYNS. *L. e. Warneri, L. Schilleriana* (F. & P. 1859, 153), *L. Warneri* (W. S. O. iii. 1). *splendens* is a fine form of this.

L. e. Stelzneriana (Stelzner's). *fl.* smaller than in the type; sepals and petals pure white, the petals much broader than the sepals; lip shortly lobed, blush-white, the throat yellowish-white, the front lobe purplish-crimson, which colour is continued along the edges as far as the tips of the side lobes. Brazil. SYN. *L. Stelzneriana* (F. d. S. xiv. 1494-5).

L. e. Tautziana (Tautz'). *fl.*, sepals light purple, very broad; petals dark purple, very broad, cuneate-obovate; lobes of lip white, with dark tips; central lacinia dark purple; column sulphur-coloured at base, purple at top.

L. e. Warneri (Warner's). A synonym of *L. e. Schilleriana.*

L. e. Wolstenholmiæ (Mrs. Wolstenholm's). *fl.* light amethyst, white, and purplish-rose, 7in. across; lip with a deep purple, curved blotch about the throat. Brazil. Autumn. (W. O. A. vi. 285; W. S. O. ii. 29.)

L. euspatha (beautiful-spathed). *fl.* large; sepals and petals delicate rosy-white, lanceolate; lip obscurely three-lobed, pale yellow in the tube, rich, dark purple on the front part; spathes 4in. to 5in. long. *l.* thick, oblong, emarginate, 9in. to 11in. long, 2½in. broad. Pseudo-bulbs stout, clavate, 1ft. high. Brazil, 1887. A supposed hybrid between *L. purpurata* and *Cattleya intermedia.*

L. exoniensis (Exeter). The correct name of the plant described on p. 281, Vol. I., as *Cattleya exoniensis.*

L. felix (fruitful). *fl.* 4in. to 5in. in diameter, usually two to a peduncle; sepals and petals pale rosy-mauve, the petals broader and more brightly coloured than the sepals; side lobes of the lip creamy-white externally, the middle lobe purple, veined and reticulated with maroon, and bordered with white, the disk yellow, streaked with purple. A dwarf hybrid, of uncertain parentage. SYN. *Cattleya felix.*

L. glauca (glaucous). The correct name of the plant described on p. 203, Vol. I., as *Brassavola glauca.*

L. Gouldiana (Jay Gould's). *fl.*, sepals and petals warm purple, strongly acuminate; lip trifid, the side laciniæ white, edged purple, very long, blunt, antrorse, the middle one dark purple, white at base, cuneate-obovate, retuse; column white, spotted purple; peduncle purple, over 1ft. long. *l.* cuneate-ligulate, acute, nearly 1ft. long. 1887. Perhaps a natural hybrid.

L. harpophylla. A few years ago this species was very rare: now it is somewhat common. Fig. 30 gives an idea of the habit and general aspect of the plant.

L. Horniana (Horn's). *fl.* of very strong substance; sepals and petals white, lanceolate, acute; lip trilobed, the basilar part yellow, the centre of the disk lined purple; lobes mauve-purple, bordered white, the anterior one having a projecting, white space. A hybrid between *L. elegans* and *L. purpurata.*

L. intricata (intricate). A variety of *L. elegans.*

L. irrorata (bedewed). A variety of *L. elegans.*

L. Leeana (Lee's). *fl.*, sepals and petals rosy-magenta; anterior lobe of the lip bright magenta-crimson, the lateral lobes pale rose, inclosing the column, with two magenta-crimson blotches at the tips. September. Habit dwarf. Supposed to be a natural hybrid.

L. lilacina (lilac). *fl.*, sepals and petals pale lilac; lip white, marked on the inside of the side lobes with purple lines, and having a rayed, purple blotch on the disk; peduncle two or more-flowered. A supposed hybrid between *L. crispa* and *L. Perrinii.*

L. lobata (lobed). The correct name of the plant described on p. 282, Vol. I., as *Cattleya lobata.* SYNS. *L. Boothiana, L. Rivieri.*

Lælia—*continued.*

L. peduncularis. This is now regarded as a variety of *L. rubescens*, and its correct name is *L. r. rosea.*

L. Pilcheriana lilacina (lilac). This is merely a small-flowered form. 1886.

L. porphyritis (purple). *fl.* similar to those of *L. pumila;* sepals purple and greenish, ligulate, acute; petals light purple, broader; lip warm purple, with a light yellowish disk. Pseudo-bulbs cylindrical, furrowed, one or two-leaved. Brazil, 1886. A supposed hybrid between *L. pumila* and *L. Dormaniana.*

L. præstans. This is now regarded as a variety of *L. pumila.*

L. pumila (dwarf). The correct name of the plant described on p. 282, Vol. I., as *Cattleya marginata.* (M. O. ii. 78.) SYN. *C. pumila.*

L. p. Curleana (Curle's). *fl.* with a few dark streaks on the sepals, and some oblique, radiating lines on the margins of the petals and outside the lobes of the lip. 1886.

L. p. Dayana (Day's). The correct name of the plant described on p. 228, Vol. II., as *L. Dayana.* (W. O. A. iii. 132.)

L. p. præstans (excelling). The correct name of the plant described on p. 229, Vol. II., as *L. præstans.* (F. d. S. xviii. 1900; R. X. O. ii. 114.)

L. purpurata atropurpurea (dark purple). *fl.*, sepals and petals deep rose; lip large and open, rich magenta-purple, the colour extending far into the throat, which is orange-yellow, veined purple. Brazil.

L. p. Brysiana (Brys'). *fl.*, sepals and petals flushed with pale rose-purple; front lobe of the lip deep purple. SYN. *Cattleya Brysiana.*

L. p. Lowiana (Low's). *fl.* very large; sepals and petals rose-coloured; lip very dark mauve-purple, the little light yellow at base interrupted by dark veins; column purple at top, with purple lines in front. 1887.

L. p. Russelliana (Russell's). *fl.* large; sepals white, suffused lilac, rather narrow; petals slightly deeper-coloured and broader; lip rosy-lilac, large, with a band of light rose near the yellow, rose-pencilled throat. Brazil. Very rare. (W. O. A. vi. 269.) SYN. *L. Russelliana.*

L. p. Schrœderii (Baron von Shrœder's). *fl.*, sepals and petals pure white; inner surface of the tube of the lip pale ochreous-yellow, with radiating lines of deep purple, the anterior lobe mauve-purple, bordered with white. (W. O. A. i. 2.)

L. Rivieri (Rivière's). A synonym of *L. lobata.*

FIG. 30. LÆLIA HARPOPHYLLA, showing Habit and detached Inflorescence.

L. rubescens (reddish). The correct name of the plant described on p. 227, Vol. II., as *L. acuminata.* (B. R. 1845, 69; M. O. iii. 81; W. O. A. iv. 163.)

L. r. alba (white). *fl.* white, with a yellow stain on the lip.

L. r. rosea (rosy). The correct name of the plant described on p. 229, Vol. II., as *L. peduncularis.*

Lælia—*continued.*

L. Russelliana (Russell's). A variety of *L. purpurata.*

L. Schilleriana (Schiller's). A variety of *L. elegans.*

L. Schrœderii (Baron von Schrœder's). A variety of *L. purpurata.*

L. Sedeni (Seden's). *fl.* 4in. to 5in. in diameter; sepals and petals bright rose-purple; side lobes of the lip pale purple, bordered with magenta-purple, the middle lobe deep, velvety magenta-purple; column white, stained with purple; peduncles many-flowered. A hybrid between *Cattleya superba* and *L. elegans.*

L. Stelzneriana (Stelzner's). A variety of *L. elegans.*

L. timora (timorous). *fl.* about the same size and shape as those of *L. pumila præstans*, but the petals and lip are more wavy, the colour of the sepals and petals is lighter, being of a delicate rosy-lilac; the sepals are oblong, acute; the petals more than twice as broad, undulated; lip purple, with a sulphur-white mark. 1887. A hybrid betwen *L. pumila Dayana* and *Cattleya Luddemanniana.*

L. Tresederiana (J. S. Treseder's). *fl.*, sepals and petals rose, shaped as in *L. crispa*, but the petals less wavy; lip deep rose, cordate at the very base, expanded, trilobed, the side lobes margined white, the disk yellow; column white. *l.* two, 5in. to 6in. long, 2in. broad, cuneate-oblong. Hybrid.

L. triophthalma (three-eyed). *fl.* 4in. to 5in. in diameter; sepals and petals rose-purple, much paler at base: side lobes of the lip white, obliquely streaked with purple, the middle lobe rich amethyst-purple, with a narrow, white margin, and a yellow disk, crossed transversely by a purple streak, the basal division similarly crossed longitudinally, giving the disk a tripartite appearance which suggested the name. A hybrid between *Cattleya superba* and *L. exoniensis.* SYN. *Cattleya triophthalma.*

L. Warneri (Warner's). A synonym of *L. elegans Schilleriana.*

LÆLIO-CATTLEYA BELLA. A synonym of **Lælia bella** (which *see*).

LANDOLPHIA. To the species described on p. 232, Vol. II., the following should now be added:

L. florida (flowery). Indiarubber-tree of Tropical Africa. *fl.* white, orange-stained towards the centre, scented, shortly pedicellate; calyx small; corolla tube straw-yellow, 1in. long, the lobes 1in. long, linear-oblong, obtuse; cymes pedunculate, many-flowered. June. *l.* ample, shortly petiolate, ovate-oblong, obtuse or acute, entire, rounded or sub-cordate at base, with six to eight nerves on either side the midrib. Tropical Africa, 1878. (B. M. 6963.)

LAPEYROUSIA. To the species described on p. 235, Vol. II., the following should now be added:

L. grandiflora (large-flowered). *fl.*, perianth tube 1in. long; limb bright scarlet, 2in. in diameter, the segments oblong or oblong-lanceolate; spikes lax, four to ten-flowered; peduncle (including the inflorescence) 1ft. long. October. *l.*, produced ones six to eight in a distichous, nearly basal rosette, linear, 6in. to 12in. long. Eastern tropical Africa, 1883. (B. M. 6924.)

LASIA (from *lasios*, rough; in allusion to the prickly surface). ORD. *Aroideæ* (*Araceæ*). A monotypic genus. The species is a robust, marsh-loving, stove herb, requiring similar culture to **Anthurium** (which *see*, on p. 85, Vol. I.).

L. heterophylla (variable-leaved). A synonym of *L. spinosa.*

L. spinosa (spiny). *fl.*, spathe 6in. to 10in. long, the tube 1½in. to 2in. long, the blade very long, narrow, convolute above; spadix cylindrical, obtuse, ¾in. to 1½in. long, when fruiting 2½in. to 3½in. long; peduncle 8in. to 12in. long. *l.* very variable, hastate when young, when old more or less deeply pedate-pinnatipartite, 8in. to 12in. long and broad, the lateral partitions two or three, linear-oblong or oblong-lanceolate, more or less acuminate, narrowed towards the base; petioles 8in. to 20in. long. Caudex 1½in. thick, more or less densely prickly. India. SYN. *L. heterophylla. Cyrtosperma Martveieffianum* is probably identical with this.

LATHYRUS. To the species described on pp. 237-8, Vol. II., the following should now be added:

L. azureus (azure-blue). This plant (referred to in F. & P. 1881, p 22) is identical with the old *L. sativus*, described on p. 238, Vol. II

L. Davidii (David's). *fl.*, corolla yellowish-white, at length ochreous; peduncles many-flowered, ultimately exceeding the leaves. *fr.*, pods narrow-linear. *l.* three or four-jugate; leaflets oval, rhomboid-oval, or oval-oblong, obtuse at both ends or slightly acute at apex; stipules semi-cordate or semi-sagittate. Japan, North China, 1883. A tall, highly glabrous perennial. (R. G. 1127.)

L. splendens (splendid). *fl.* scarlet-purple, large, arranged in clusters of from ten to twelve; keel almost 1in. long. Lower California.

LAYIA. To the species described on p. 244, Vol. II., the following should now be added:

L. elegans (elegant). *fl.-heads* numerous, 1½in. across; ray florets yellow on the basal half, white above; disk yellow. *l.*, lower ones pinnatifid; cauline ones narrow-lanceolate, sub-amplexicaul. Stems much-branched, reddish, pubescent. 1883. A dwarf, but very showy and floriferous annual.

L. glandulosa (glandular). *fl.-heads* solitary, 1in. in diameter; ray florets white, flat, broadly obovate, three-lobed at apex; disk yellow, small. Summer. *l.* alternate, linear, obtuse, 1in. to 1½in. long. 1886. A beautiful, glandular-hairy annual, branching from the base. (B. M. 6856.)

LEEA. To the species described on p. 247, Vol. II., the following variety should now be added:

L. amabilis splendens (splendid). A lovely variety, having the stems, petioles, midrib, and under surface of the leaves coloured red. Borneo, 1884. (I. H. 518.)

LEONTICE. To the species described on p. 249, Vol. II., the following should now be added:

L. Alberti (Albert Regel's). *fl.* ochreous, streaked reddish-brown at back, nearly 1in. across; raceme conical. April. *l.*, fully-formed ones on petioles 4in. to 5in. long, sub-digitately five-partite, the leaflets rather fleshy, elliptic, obtuse; stipules ¾in. long. Stems several, very stout, each giving off two radical, undeveloped leaves (which fully develop long after the flowering period), and a stout flower-stem 6in. to 8in. high. Western Turkestan, 1886. Half-hardy. (B. M. 6900; R. G. 1057, f. 2.)

LEPIRONIA (in part). Synonymous with **Mapania** (which *see*).

LEPTACTINA. *See* **Leptactinia.**

LEPTACTINIA (from *leptos*, slender, and *aktin*, a ray; in allusion to the circle of narrow lobes in the limb of the corolla). Sometimes spelt *Leptactina.* ORD. *Rubiaceæ.* A genus comprising four species of stove shrubs, natives of tropical Africa. Flowers conspicuous, fascicled at the tips of the branchlets, sessile or shortly pedicellate; calyx five-parted; corolla tube elongated, silky, the limb of five spreading, narrow-oblong or lanceolate lobes; stamens five; fascicles sessile or pedunculate. Leaves opposite, rather large, shortly petiolate, elliptic, obovate-oblong, or lanceolate, membranous; stipules ample, connate at base. Branchlets terete. *L. tetraloba* is the only species in cultivation. It thrives in well-drained, fibrous loam, and may be increased by cuttings.

L. tetraloba (four-lobed). *fl.* solitary, sessile, terminal; calyx ¼in. long: corolla white, minutely papillose outside, the tube 1¼in. long, the lobes ¾in. long, with alternating coronal appendages one line long. *l.* 2½in. to 7in. long, ¾in. to 1¾in. broad, oblanceolate, cuneately narrowed to the rather acute base; petioles two to nine lines long. Usagara Mountains, 1885. A neat little, bushy shrub.

LEPTANTHE. A synonym of **Macrotomia** (which *see*).

LEPTOSPERMUM. Including *Glaphyria.* To the species described on p. 252, Vol. II., the following should now be added:

L. Annæ (Mrs. Anna Schadenberg's). *fl.* white, with red stamens, small, axillary and terminal, solitary or two or three together. *l.* lanceolate, ¼in. to ¾in. long, ascending. Branches slender, ascending. Mindanao, 1885. (R. G. 1184.)

LESCHENAULTIA. To the species described on p. 253, Vol. II., the following should now be added:

L. formosa major (greater). *fl.* dark orange-red, numerous, pendulous; peduncles ¾in. long. *l.* closely set, linear. 1886. A free-flowering shrub. (R. H. 1886, p. 468.)

LESPEDEZA. To the species described on p. 253, Vol. II., the following should now be added:

L. macrocarpa (large-fruited). *fl.* purple, small, numerous, disposed in racemes, produced during several months. *l.* trifoliolate. North China, 1883. A hardy, ornamental shrub.

LEUCOIUM. Perianth broadly campanulate; tube none; segments sub-equal, ovate or oblong, connate towards the base. To the species described on p. 257, Vol. II., the following should now be added:

L. hyemale (wintry). *fl.*, perianth white, the segments oblong, imbricated, ½in. long, tinged green at back, the three inner shorter and more obtuse than the outer; peduncle slender, erect, one or two-flowered. Spring. *l.* two to four, contemporary with

Leucoium—*continued.*

the flowers, narrow-linear, 6in. to 12in. long. Bulb brown-tunicated. Maritime Alps. (B. M. 6711; Fl. Ment. 21.) SYN. *L. nicæense.*

L. nicæense (Nicean). A synonym of *L. hyemale.*

L. roseum (rosy). The correct name of the plant described on p. 14, Vol. I., as *Acis roseus.*

L. r. longifolium (long-leaved). This differs from the type in its larger flowers, longer leaves, and more floriferous habit Corsica, 1886.

LEUCOPHYTA. Included under **Calocephalus** (which *see*).

LIABUM. To the species described on p. 259, Vol. II., the following should now be added:

L. Maroni (Maron's). *fl.-heads* pale yellow, radiate, corymbose, on long peduncles. *l.* petiolate, triangular-hastate, distantly toothed, 4in. to 5in. long, 3in. to 4in. broad. *h.* about 2ft. Brazil, 1887. A greenhouse or half-hardy, white-tomentose perennial. SYN. *Andromache Maroni.*

LIGUSTRINA PEKINENSIS. A synonym of **Syringa pekinensis** (which *see*).

LIGUSTRUM. To the species described on pp. 263-4, Vol. II., the following should now be added:

L. japonicum Alivoni (Alivon's). *l.* ovate-lanceolate, acuminate, entire, narrowed at base, wavy-margined, dark green, shining, irregularly variegated pale yellowish. 1886. A robust, garden variety.

LILIUM. To the species and varieties described on pp. 266-74, Vol. II., the following should now be added:

L. auratum virginale (virgin-white). *fl.* white, lacking the usual spotting, being simply banded yellow. 1882. A rare form.

L. columbianum lucidum (clear). *fl.* bright golden-yellow, spotted with brown, agreeably scented, nodding, with recurved segments. *l.* dark, glossy green, lanceolate or ovate, alternate below and verticillate above. Stem 5ft. to 4½ft. high, green or greenish-purple. Bulb rather small, with narrow, sharply-pointed scales. California.

L. elegans cruentum (bloody). *fl.* of a deep blood-crimson, mottled and streaked with a deeper shade. 1882. One of the finest of the group.

L. e. robustum (robust). *fl.* deep orange, marked all over with small spots of dark brown, large and handsome. 1882.

L. japonicum Brownii viridulum (slightly-greenish). *fl.* creamy-white, tinged on the outside with yellowish-green, having only a faint dash of claret-brown. Japan, 1885.

L. pardalinum Warei (Ware's). *fl.* varying from lemon to orange-yellow, unspotted, smaller than in the type. *l.* shorter and more cordate. Lower California, 1886.

L. speciosum Melpomene (Melpomene). *fl.* rich, bright crimson, 8in. across, the perianth segments margined with white, richly spotted. *l.* very broad. 1882.

LIMATODES ROSEA. A synonym of **Calanthe rosea** (which *see*).

LINARIA. To the species and varieties described on pp. 278-9, Vol. II., the following should now be added:

L. aparanoides splendens (splendid). *fl.* crimson, with a large, golden centre. 1888.

L. Cymbalaria maxima (greatest). *fl.* twice the size of the ordinary Ivy-leaved Snapdragon, fragrant. *l.* not quite so large, highly pubescent. 1882. SYN. *L. pallida.*

L. maroccana hybrida (hybrid). *fl.* varying in colour from rose to red and from lilac to violet, the lower petal being usually white; spikes terminal. Branches slender, upright. *h.* 1ft.

L. pallida (pale). A synonym of *L. Cymbalaria maxima.*

L. pilosa (pilose). *fl.* pale purplish-blue, with a yellow palate, and a rather incurved spur; calyx pilose. June to September. *l.* opposite and alternate, cordately rounded or reniform, villous, five to eleven-lobed, the lobes mucronulate. Branches creeping, white-hairy. Sicily, &c., 1800.

L. p. longicalcarata (long-spurred). In this variety the spur of the pale purplish flower is as long as the tube. (R. G. 1135, f. 3.)

LINDENIA. To the species described on p. 280, Vol. II., the following should now be added;

L. vitiensis (Fiji). *fl.*, corolla cream-coloured, silky-tomentose, the tube very long and slender, the segments ovate-oblong, obtuse; anthers and pistil projecting. *l.* oblong-lanceolate, glabrous, 4in. to 6in. long, 1in. to 1½in. broad; petioles and lower part of the midrib purplish. *h.* 3ft. to 4ft. Fiji, 1884. A highly ornamental shrub.

LIPARIS. To the species described on p. 283, Vol. II., the following should now be added:

L. elegans (elegant). *fl.*, sepals and petals pale greenish; lip orange-red; raceme many-flowered; scape 1ft. to 1½ft. high. *l.* 3in. to 8in. long, linear-lanceolate, acute. Pseudo-bulbs ovate, one to three-leaved. Penang, 1886.

L. latifolia (broad-leaved). *fl.* ochre; sepals oblong-ligulate, the lateral ones bent down; petals linear, reflexed; lip cuneate-dilated, emarginate, two-lobed, with dark ochre anterior margins, reddish-brown on the disk; peduncle nearly 9in. long. *l.* solitary, cuneate-oblong-ligulate, acute, protected by a sheath. Java, &c., 1885.

LIPPIA. To the species described on p. 284, Vol. II., the following should now be added:

L. bracteata (bracteate). *fl.* dull red, subtended by violaceous bracts, disposed in sub-globose heads. *l.* large, opposite, ovate, acuminate, scabrous above, tomentose beneath. 1883. An ornamental, free-flowering, greenhouse shrub.

LISSOCHILUS. To the species described on p. 286, Vol. II., the following should now be added:

L. dilectus (beloved). *fl.* rosy, with a purple lip, large; sepals linear-lanceolate, acuminate, reflexed; petals oblong, very broad; lip three-lobed, the side lobes broad, the front one nearly square, retuse; peduncle 2ft. to 3ft. high. *l.* broad. Rhizomes branched, hand-like. Congo, 1886.

L. Krebsii purpurata (purple). *fl.* 2in. in diameter; sepals dark green outside, maroon-purple inside, the margins revolute; petals bright yellow above, beneath pale cream-coloured faintly veined with red; lip dull orange-yellow, with chocolate-purple side lobes, streaked with darker lines; scape about 3½ft. high. *l.* thin, broadly lanceolate, acute, plicate, 1ft. long. South Africa, 1885.

L. roseus (rosy). *fl.*, sepals deep velvety-brown, spathulate, concave, reflexed; petals deep rose, large, oblong, apiculate, recurved; lip deep rose, three-lobed, rounded, longer than the petals, with a golden crest on the disk, the under side and the spur yellow; raceme dense, oblong; scape 3ft. to 4ft. high. *l.* stiff, erect, broadly lanceolate, plicately veined. Sierra Leone, 1841. A grand species. (B. R. 1844, 12.)

L. Sandersoni (Sanderson's). *fl.* 2in. to 2½in. in diameter; sepals dirty green, edged and nerved brown; petals pure white, much larger, obliquely and falcately broad-oblong; lip large, the side lobes dark green, with brownish veins, the mid-lobe having a pale violet, purple-streaked limb, and a yellowish-green disk; spike 1ft. long, erect; scape 6ft. to 7ft. high. June. *l.* 3ft. to 4ft. long, 3in. to 4in. broad, elongate-lanceolate, acute, narrowed into long petioles. Natal, 1879. A stately plant. (B. M. 6858.)

L. stylites (columnar). *fl.* rose-coloured, as large as a good *Zygopetalum intermedium*; sepals triangular, acuminate, reflexed; petals oblong, wide; lip nearly square, blunt-edged, dark-spotted at the base inside, having a short, conical, angled spur, and two styliform processes in the mouth. February. 1885.

LISTROSTACHYS ICHNEUMONEA. Synonymous with **Angræcum ichneumoneum** (which *see*).

LITHOSPERMUM. *L. arvense*, *L. officinale*, and *L. purpureo-cæruleum* are British plants. To the species described on p. 286, Vol. II., the following should now be added:

L. graminifolium (Grass-leaved). A synonym of *Moltkia graminifolium.*

L. rosmarinifolium (Rosemary-leaved). *fl.* bright blue, lined white, about ⅔in. in diameter, terminal. June to September. *l.* narrow, 1in. or more long. *h.* 1ft. to 2ft. Central Italy, &c. Evergreen.

LITTONIA. To the species described on p. 287, Vol. II., the following variety should now be added:

L. modesta Keitii (Keit's). A very vigorous form, much more floriferous than the type. 1886. (R. G. 1237.)

LOBELIA. *L. Dortmanna* (Water Lobelia) and *L. urens* (Acrid Lobelia) are included in the British Flora. To the species described on pp. 290-1, Vol. II., the following should now be added:

L. sub-nuda (nearly naked). *fl.* pale blue, about ½in. across, borne on rather long pedicels, and arranged in lax, naked racemes. *l.* all radical, in a reduced rosette (the stem having only a few very reduced ones), stalked, cordate-ovate in outline, the margins pinnatifidly cut, dark green above, beneath purplish, with green veins. Mexico, 1887. A small-flowered but pretty hardy annual, suitable for rockwork. (G. C. ser. iii., vol. ii., p. 204.)

LOMARIA. To the varieties of *L. Spicant* described on p. 295, Vol. II., the following should now be added:

L. Spicant Aitkeniana (Aitken's). *fronds*, lower portions contracted, the surface slightly corrugated, the apex magnified

Lomaria—*continued.*

into a huge, branching head, of which the under side bears traces of an excurrent line like the marginate Scolopendriums. County Clare, Ireland, 1882.

L. S. obovatum (obovate). *fronds* normal in outline, but the pinnæ are very much contracted at the base, so that they take a distinctly obovate form. St. Michael's, Azores, 1882.

LONCHOCARPUS. To the species described on p. 296, Vol. II., the following should now be added:

L. Barteri (Barter's). *fl.* in clusters of eight or ten, ¾in. long, shortly pedicellate; calyx reddish-brown, hemispheric; corolla rose-pink, the standard shortly clawed, the wings obtuse; racemes 1ft. to 1½ft. long. September. *l.* 1ft. long or more; leaflets five or seven, 4in. to 7in. long, petiolulate, elliptic-oblong, acuminate or caudate-acuminate. Tropical Africa. Stove climber. (B. M. 6943.)

LONICERA. The British Flora embraces *L. Caprifolium* (Woodbine), *L. Periclymenum*, and *L. Xylosteum*. To the species and varieties described on pp. 296-7, Vol. II., the following should now be added:

L. Alberti (Albert Regel's). *fl.* rose-coloured. *l.* soft, linear, somewhat resembling those of Rosemary, greyish-green, glaucous beneath. Branches slender. 1887. (R. G. 1065.) SYN. *Chamæcerasus Alberti* (of gardens).

L. alpigena (alpine). *fl.* greenish-fuscous-red; corolla gibbous at base. April. *l.* oval-lanceolate, acute, glabrous or pubescent, very shortly petiolate, scarcely toothed. Stem erect. *h.* 6ft. Central and Southern Europe, 1596. (J. F. A. 274.)

L. a. nana (dwarf). This only differs from the type in its dwarfer, more compact habit. SYN. *Chamæcerasus alpigena nana* (of gardens).

L. gigantea (gigantic). *fl.* yellow, tubular, arranged in a large, terminal panicle. *l.* dark green, amplexicaul; floral ones connate. 1883. A floriferous garden plant.

L. hispida (hispid). *fl.* greenish-white, pendulous; peduncles shorter than the ovate, ciliated bracts, two-flowered. *fr.* purple. *l.* shortly petiolate, ovate-elliptic, 1½in. to 2in. long, rounded or cordate at base, setose-ciliated, glabrous on both surfaces. Stem erect; branches hispid. *h.* 2ft. to 3ft. Central Asia to Siberia, 1883. (R. G. 1100.)

L. Maacki (Maack's). *fl.* white, numerous, axillary, with a narrow, funnel-shaped tube and a two-lipped limb of five segments, of which four are united and spread in one direction, the fifth lobe taking the opposite one. *l.* ovate-elliptic, acuminate, rounded at base. *h.* 10ft. to 15ft. Mandchuria, 1884. A rather pretty, much-branched shrub. (R. G. 1162.)

LORANTHUS (from *loron*, a strap, and *anthos*, a flower; in allusion to the shape of the petals). ORD. *Loranthaceæ*. A large genus (about 330 species) of stove, greenhouse, or hardy, parasitic shrubs, rarely terrestrial trees or shrubs, broadly distributed throughout the tropics, beyond which few extend. Flowers often beautifully coloured, small or long, hermaphrodite or by abortion dicœcious; perianth double; calyx truncate or four to six-toothed; petals four to six, valvate. Fruit baccate or drupaceous. Leaves entire, often thick or fleshy. *L. flavidus* is an interesting, hardy or half-hardy parasite, stated, in "Gartenflora," to be in cultivation in England: this is, however, doubtful. It may possibly be grown by sowing the berries upon the above-ground roots or on the branches of the Beech-tree.

L. flavidus (yellowish). *fl.* produced in small racemes from the previous year's growth; perianth yellowish, ½in. long, having a slender tube, and four narrow, reflexed segments. *l.* opposite, petiolate, oblong, about 1½in. long, obtuse and thick. New Zealand, 1885.

LUPINUS. To the species described on pp. 302-3, Vol. II., the following variety should now be added:

L. albo-coccineus nanus (dwarf, white and scarlet). *fl.* sweetly scented; spikes rich rosy-crimson half-way up, thence to the apex pure white, borne well above the foliage. Summer. 1887. This forms handsome, compact bushes about 1ft. in height. (G. C. ser. iii., vol. ii., p. 597.)

LYCASTE. To the species and varieties described on p. 304, Vol. II., the following should now be added:

Lycaste—*continued.*

L. citrina (citron-coloured). *fl.* large, thick and fleshy; sepals and petals lemon-coloured; lip white, marked lilac. Brazil. A robust, but rare plant, with the habit of *Bifrenaria Harrisoniæ*.

L. Cobbiana (Cobb's). *fl.*, sepals greenish-yellow; petals greenish-white; lip white, distinctly fringed. September. Pseudo-bulbs long and narrow. Native country unknown.

L. costata (ribbed). *fl.*, very pale yellow; dorsal sepal oblong-lanceolate, the lateral ones broadly lanceolate-falcate, united at base in a conical spur; petals obversely lanceolate, shorter than the sepals; lip three-lobed, concave, the middle lobe roundish-cordate, recurved at apex, entire, the lateral ones short, ovate; bracts cucullate, acute. Pseudo-bulbs angular, ovate-conical, each terminated by two lanceolate, petiolate leaves. Columbia, 1842. (B. R. xxix. 15; R. G. 1141.)

L. cristata Randi (Rand's). A synonym of *L. Randi*.

L. c. Modiglianiana (Cavaliere Modigliani's). *fl.* almost whitish. 1888.

L. Denningiana (Denning's). *fl.* almost as large as those of *L. gigantea*; sepals and petals whitish-green, the latter rather smaller than the former; lip reddish-brown, the front lobe oblong, blunt, toothleted, reflexed, the disk bearing a large, rhomboid, acute appendage. *l.* cuneate-oblong. Pseudo-bulbs broadly pyriform, furrowed, glaucous. Ecuador.

FIG. 31. LYCASTE SKINNERI.

L. Deppei punctatissima (much-dotted). *fl.* whitish-green, thickly marked with small, dark purple dots; lip yellow, having radiating, purple lines. Guatemala, 1882.

L. grandis (great). *fl.* chocolate-brown, barred on the lower half of the lanceolate, acuminate sepals and petals with yellowish-green and cream-colour, the edges creamy; lip with a blackish-purple claw, widening into an oblong, obtuse, creamy front lobe, which is hairy on the apical portion, and has a pair of oblong lobes on each side of it, the two basal ones being incurved and pale chocolate-brown, and the two front ones horizontal and blackish-purple. Brazil, 1884. A curious Orchid. SYN. *Paphinia grandis* (W. O. A. iv. 145).

L. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ*.

L. jugosa punctata (dotted). *fl.* greenish-yellow, spotted with reddish-black. 1883.

L. j. rufina (rufous). *fl.*, sepals pale yellowish-green; petals speckled with blackish-purple; lip marked brown. 1883.

L. Lindeniana (Linden's). *fl.* large and showy; sepals and petals lanceolate, acuminate, the central part dark reddish-purple (broken up into lines and spots on the sepals), the margins white; lip white, with a dark purplish-brown base, the front lobe hastate, with numerous filiform and papillate crests. *l.* elliptic, acute. Pseudo-bulbs oblong-ovoid, 2in. to 2½in. long. Orinoco. SYN. *Paphinia Lindeniana*.

L. macrophylla (large-leaved). *fl.* bold; sepals olive-green; petals pale nankeen-sulphur, nearly as long as the sepals, broadly

Lycaste—*continued.*

rounded and undulated at the extremity; lip pale sulphur, spotted purple on the edges of the lobes, and having a tongue-shaped appendage. *l.* ample, lanceolate, plaited. Pseudo-bulbs large, ovate, ribbed. Caraccas, 1837. SYN. *Maxillaria macrophylla.*

L. plana (flat). *fl.* about 3½in. across; sepals madder-red, flat, oblong, spreading; petals white, with a rosy-crimson eye-blotch on their recurved tips; lip small, white, spotted rosy-crimson, the roundish front lobe serrated, the appendage oblong, blunt, and obsoletely three-lobed. Winter. *l.* bold, oval-lanceolate, plicate. Pseudo-bulbs large, ovate-oblong, ribbed. Bolivia, 1841. (B. R. 1843, 35.)

L. p. Measuresiana (Measures'). *fl.*, sepals reddish-brown, tipped green, green outside; petals and lip white, densely spotted rose-purple, except on the margins of the petals. Bolivia, 1887. A beautiful, free-flowering variety. (W. O. A. vii. 306.)

L. Randi (Rand's). *fl.* 2¼in. in expanse; sepals and petals purplish-red, transversely barred, and longitudinally striped along the margins with white; lip marked with the same colours, crested; peduncles two-flowered. *l.* 3in. to 4in. long. Pseudo-bulbs ellipsoid, 1in. long. 1886. (L. 30.) SYNS. *L. cristata Randi, Paphinia Randi.*

L. rugosa (wrinkled). *fl.* creamy-white, covered with red spots, which now and then become confluent, large, of a waxy appearance; raceme pendulous, two-flowered. *l.* thin, linear, acuminate. Pseudo-bulbs very small, terete, furrowed. 1882. A remarkable and attractive Orchid, of dwarf growth. SYN. *Paphinia rugosa.*

L. Schilleriana (Schiller's). *fl.*, sepals greenish-brown, about 4in. long, spreading; petals pure white, smaller, converging over the base of the lip; lip pure white in front, with a faint tinge of yellow at the base; scapes about 6in. high. *l.* and pseudo-bulbs as in *L. Skinneri*, but the leaves more erect. Central America.

L. Skinneri alba (white). *fl.*, sepals and petals pure white; lip white, with the faintest tinge of yellow about the centre, the tongue-shaped appendage yellow. Guatemala, 1841. (F. M. ser. ii. 35, f. 1.) The type is shown at Fig. 31.

L. S. amabilis (lovely). *fl.* about 6in. across; sepals pale rose, about 2in. broad; petals magenta, broad; lip white, blotched pale rosy-purple. Guatemala.

L. S. nigro-rubra (blackish-red). *fl.* very large; sepals rather deep mauve or lilac-rose; petals of a rich puce-purple or plum-colour; side lobes of the lip deep rose, the front lobe deep blood-purple, the appendage yellow. Guatemala. A handsome variety. (F. M. ser. ii. 35, f. 2.)

L. S. reginæ (queenly). *fl.*, sepals light rosy-purple; petals and lip dark magenta-purple. Guatemala, 1887. (W. O. A. vi. 283.)

L. S. roseo-purpurea (rose and purple). *fl.* 7in. across; sepals and petals bright rose; lip intense magenta-crimson. Guatemala.

L. S. vestalis (vestal). *fl.* white, 7in. across; sepals 1¾in. wide; petals faintly veined pale rose on the inner face; lip faintly marked pale rose. Guatemala.

LYCHNIS. The following are British plants: *L. alpina, L. diurna, L. Flos-cuculi, L. Githago* (correct name *Githago segetum*, Corn Cockle), *L. vespertina*, and *L. viscaria.* To the species and varieties described on pp. 305-6, Vol. II., the following should now be added:

L. fulgens Haageana grandiflora (large-flowered). *fl.* of a greater variety of colours, and larger than in the type. 1888.

L. hybrida (hybrid). *fl.* variable in colour, usually crimson or scarlet, disposed in close, symmetrical heads. *h.* 2½ft. to 3ft. A hybrid between *L. coronaria* and *L. flos-Jovis.*

LYGODIUM. To the species described on pp. 308-9, Vol. II., the following should now be added:

L. scandens Fulcheri (Fulcher's). *cau.* semi-terete, pale brown, producing short branches. *fronds* in pairs, 6in. to 9in. long, 4in. to 6in. broad, having four to six or more pairs of shortly petiolate pinnæ; sterile pinnæ oblong-lanceolate, 2in. to 3in. long; fertile ones usually shorter, the little spikelets of fructification projecting from the marginal teeth. 1882. SYN. *Hydroglossum scandens Fulcheri.*

MACLURA TINCTORIA. A synonym of **Chlorophora tinctoria** (which *see*).

MACROCHORDIUM. Included under **Æchmea** (which *see*).

MACROSCEPIS (from *makros*, long, and *skepe*, a covering; in allusion to the size of the calyx). ORD. *Asclepiadeæ.* A small genus (three or four closely related species) of stove, climbing sub-shrubs natives of Peru,

Macroscepis—*continued.*

Columbia, and Central America. Flowers rather large, in clustered, axillary cymes; calyx segments five, ovate-lanceolate; corolla tube ovoid or broadly cylindrical, the limb thick, five-lobed, broadly spreading. Leaves opposite, ample, cordate. *M. obovata*, the only species calling for mention here, requires similar treatment to **Physianthus** (which *see*, on p. 115, Vol. III.).

M. obovata (obovate-leaved). *fl.*, corolla yellowish-brown, 1in. in diameter. November. *l.* shortly petiolate, 4in. to 6in. long, obovate, contracted above the cordate base. Western tropical America, 1884. Plant densely hirsute. (B. M. 6815.)

MACROTOMIA (from *makros*, long, and *tome*, a cutting; in allusion to the long divisions of the calyx). SYN. *Leptanthe.* ORD. *Borragineæ.* A genus embracing seven or eight species of erect, hispid, perennial herbs, natives of the Himalayas and the Orient. Calyx five-parted, with long-linear segments; corolla funnel or nearly salver-shaped, with a long, slender tube, and five broad, imbricated lobes; stamens five, included; cymes dense, corymbose or spicate. Nutlets four, or fewer by abortion. Leaves alternate. *M. Benthami*, the only species introduced, thrives in ordinary, well-drained, garden soil, and may be increased by seeds.

M. Benthami (Bentham's). *fl.* sessile, 1in. long; calyx segments tipped purple; corolla lobes dark maroon-purple, triangular-ovate; thyrse 8in. to 12in. high. May. *l.*, radical ones 6in. to 10in. long, narrow-lanceolate, hirsute; cauline ones many, smaller, sessile, linear-lanceolate, acute. *h.* 1ft. to 3ft. Western Himalaya, 1884. Hardy. (B. M. 7003.)

FIG. 32. MAMMILLARIA ECHINUS.

MAMMILLARIA. To the species described on pp. 320-2, Vol. II., the following should now be added:

M. barbata (bearded). *fr.* green, oblong, crowned with rudimentary flowers. Stem simple, depressed-globose; axils of the tubercles naked; prickles radiating in several series, very numerous, about forty white, piliform outer ones, and ten to fifteen more robust inner ones, the central ones singularly robust, uncinate, fuscous, erect. New Mexico, 1885. (R. G. 1208, a-c.)

M. cornimamma (horny-nippled). *fl.* light yellow, with a purplish stripe on the back of all but the innermost segments, 3in. broad. Summer. Stem sub-globose, about 2½in. in diameter, greyish-green, the axils and areolæ of the younger tubercles densely white-woolly; tubercles large, conical, grooved down the upper face; outer spines 10in. to 13½in. long, tipped brown, the inner ones one to three, dark brown, stouter and longer. Native country unknown. 1887.

M. echinata (prickly). Stem often multiplex, cylindrical, elongated; tubercles naked, broad at base, very short, obtuse at apex; young areolæ slightly tomentose; prickles bristle-like, sixteen to eighteen, radiating, spreading-recurved, yellow, much longer than the tubercles, the two central ones rigid, slightly fuscous. Mexico, 1885. (R. G. 1208, d-e.)

M. echinus (hedgehog-like). *fl.* yellow, nearly 2in. long, cup-shaped, produced two or three together at the top of the stem. June. Stem about the size and shape of a small hen's-egg, completely hidden by the spines; tubercles ½in. long, arranged in thirteen spiral rows; spines white, radiating, with a central, spike-like one. Mexico. Warm house. See Fig. 32.

FIG. 33. MAMMILLARIA ELEPHANTIDENS.

M. elephantidens (elephant's-tooth). *fl.* 3in. wide; sepals violet, with white margins; petals bright rose, purple at base, a line of purple extending down the middle; stamens numerous, with purple filaments and yellow anthers. Autumn. Stem globose-depressed, 6in. to 8in. in diameter, bright, shining green; tubercles smooth, round, 1½in. long, furrowed across the top (which at first is filled with wool, but when old is naked), the base furnished with a dense tuft of white wool; spines recurved, radiating in groups of eight, springing from the furrows. Paraguay. See Fig. 33.

Mammillaria—*continued.*

FIG. 34. MAMMILLARIA FISSURATA.

M. fissurata (fissured). *fl.* rose-coloured, 1½in. wide, growing from the middle of the stem. September and October. Stem and rootstock shaped like a whiptop, the rootstock being thick and woody; tubercles arranged in a thick layer, spreading from the centre, rosette-like. Mexico, 1885. This species resembles some of the Gasterias. See Fig. 34.

M. longimamma (long-nippled). *fl.* citron-yellow, large and handsome, the short tube hidden in the tubercles; petals 1½in. long, narrow, pointed, all directed upwards; stamens short, numerous. Early summer. Stem seldom more than 4in. high, branching at the base when old; tubercles 1in. long, ½in. in diameter, terete, slightly curved, narrowed to the apex, each crowned with a tuft of about a dozen spines. Mexico. See Fig. 35.

M. macromeris (large-parted). *fl.* about 3in. long and wide, arising from the centre of the stem; petals carmine, almost

Mammillaria—*continued.*

FIG. 35. MAMMILLARIA LONGIMAMMA.

purple just before fading, regular and spreading as in the Oxeye Daisy August. Stem about 4in. high, naked at base, woody and wrinkled when old; tubercles as in *M. longimamma*, but with long, curving, radial spines, like needles, often 2in. long, white or rose-tinted when young, almost black when old. Mexico. Owing to the woody nature of the rootstock, and the long, tap-like habit of the stouter roots, this should be planted in pans instead of pots. See Fig. 36.

M. phellosperma (corky-seeded). Stems simple, sometimes proliferous at the base, globose when young, afterwards almost cylindrical or pear-shaped, 5in. high, 2in. in diameter; tubercles ½in. long, arranged in twelve spiral rows, slightly woolly in the axils; spines radiating in two rows, about fifty on each tubercle, the three or four central ones hooked at the tip or sometimes straight, and almost black, while the remainder are almost white. This plant has not been known to flower under cultivation.

M. Scheerii (Scheer's). *fl.* terminal, erect, with several whorls of spreading, recurved petals, the lower ones tinged crimson, the upper ones pale yellow, forming a shallow cup 2in. across. Stem 7in. high and 5in. in diameter at base; tubercles large, swollen, somewhat flattened, the apices crowned with about a dozen brown spines. Mexico.

M. Schelhasii (Schelhas'). *fl.* white, with a line of rose down each petal, ¾in. across. Early summer. Stem producing offsets freely at the base, which grow into full-sized stems, and develop young ones till a compact cushion is formed; tubercles closely arranged, cylindrical, shining green, with fifteen to twenty radial, white, hair-like spines, ½in. long, and three inner, thicker ones, usually only one being hooked. Mexico. See Fig. 37.

M. semperviva (ever-living). *fl.* inconspicuous, scantily developed near the outside of the top of the stem. Stem pear-shaped, 3in. wide, the top slightly depressed; tubercles conical, ½in. long, their bases set in a cushion of white wool,

Mammillaria—*continued.*

their tips bearing tiny tufts of wool, and four small spines, which fall away on the tubercles becoming ripe, leaving two short, diverging, central spines. Near Zimapan, Mexico (at an elevation of 5000ft.). See Fig. 38.

M. sub-polyhedra (often many-sided). *fl.* arranged in a zone on the tops of the old stems; sepals greenish-yellow; petals bright red. May. *fr.* scarlet, 1in. long, pear-shaped. Stem simple (till it becomes old, when it develops offsets at the base), broadly cylindrical, 8in. high, 5in. in diameter; tubercles four-sided at base, prism-shaped, bearing pads of white wool in the corners at the base, and crowned with tufts of four to seven spines, usually all radial, sometimes one central. South Mexico. See Fig. 39.

M. sulcolanata (woolly-grooved). *fl.* bright yellow, Poppy-scented, nearly 2in. across, the spread of the petals suggesting Paris Daisies. June to August. *fr.* glaucous-green, egg-shaped. Stem simple when young, proliferous at sides when old, the young plants developing from the apices of the tubercles, not in the axils, as is usual; tubercles nut-shaped, large, the bases surrounded by white wool, the points bearing eight to ten rigid, brown spines, all radiating from a little pad of wool. South Mexico, 1836. See Fig. 40.

M. vivipara (stem-sprouting). *fl.* in the apex of the stem, 1½in. long and broad; petals about thirty, bright purple, fimbriated. May and June. *fr.* pale green, ½in. long.

FIG. 36. MAMMILLARIA MACROMERIS.

Mammillaria—*continued.*

FIG. 37. MAMMILLARIA SCHELHASII.

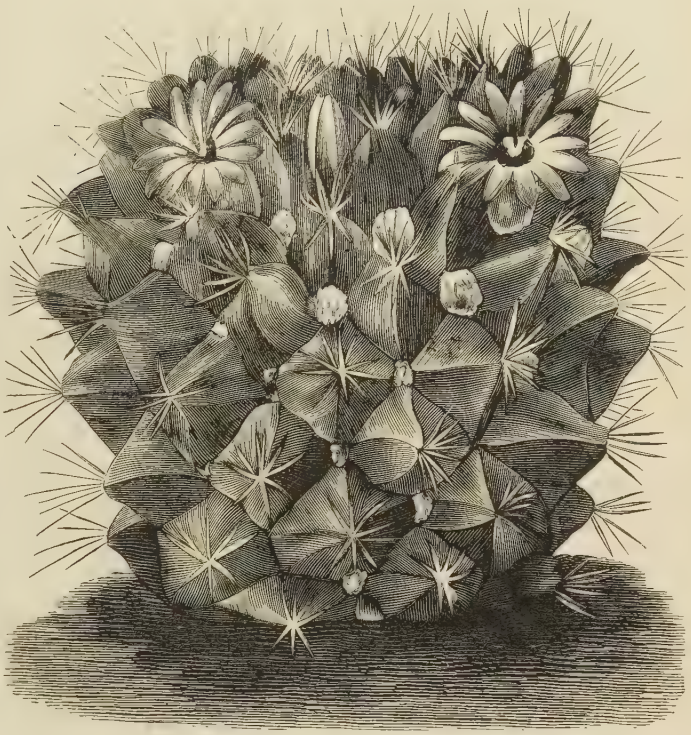

FIG. 39. MAMMILLARIA SUB-POLYHEDRA

FIG. 38. MAMMILLARIA SEMPERVIVA.

FIG. 40. MAMMILLARIA SULCOLANATA

Mammillaria—*continued.*

Stems produced in profusion, sometimes forming a cluster 3ft. in diameter; tubercles small, hidden by the spines; spines radial, about twenty to each tubercle, white, hair-like, stiff, about ½in. long, the central four or six a little longer than the others. Louisiana.

Mapania—*continued.*

beneath; petioles blackish-green, deeply channelled. 1885. An ornamental foliage plant. SYN. *Pandanophyllum Wendlandi.*

MARANTA. To the species and varieties described on pp. 326-7, Vol. II., the following should now be added:

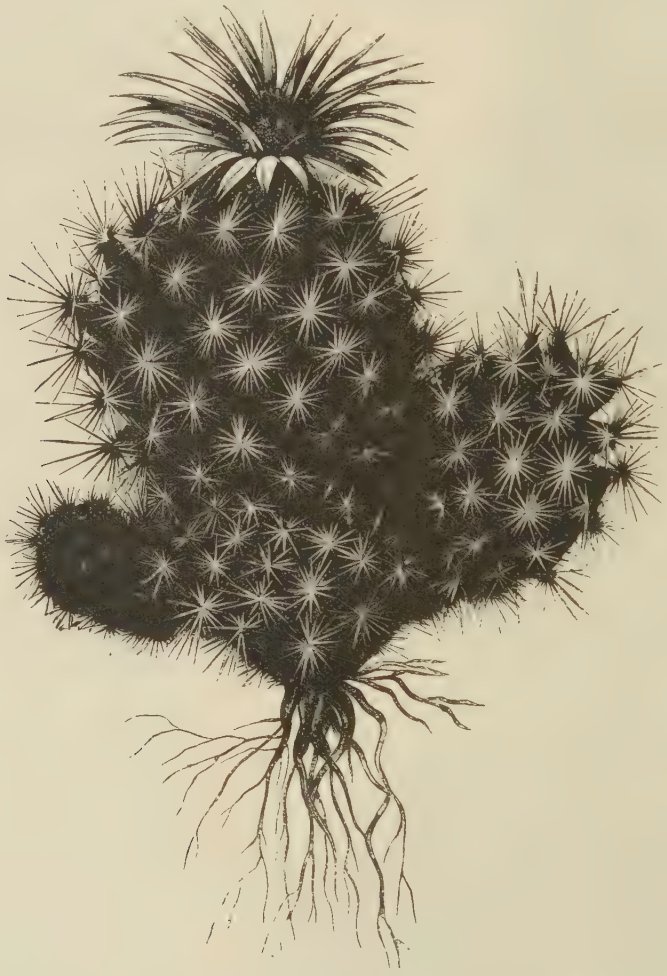

FIG. 41. MAMMILLARIA VIVIPARA RADIOSA.

M. v. radiosa (radiate). This is distinguished by its large flowers and shorter spines. See Fig. 41.

MAPANIA (probably a native name). SYN. *Lepironia* (in part). Including *Pandanophyllum.* ORD. *Cyperaceæ.* A genus embracing about thirty species of stove, perennial, sometimes very tall herbs, dispersed over the tropics. Spikelets many-flowered, borne on the stem or terminating a leafless scape, solitary or few in a sessile head, or rarely numerous and corymbosely paniculate. Leaves fascicled at the base of the stem or on the rhizome, long and rather broad, or ovate-lanceolate, on long petioles. Two species have been introduced. For culture, *see* **Cyperus,** on p. 422, Vol. I.

M. lucida (clear). *fl.*, spikelet castaneous, solitary, trigonal-ovoid, ½in. to ⅔in. long; scape dark purple, leafless, 2in. to 3in. long. *l.* trifarious, 6in. to 10in. long, 1¼in. to 1¾in. broad, three-nerved, narrow-oblong, rounded-cuneate at base, with a cusp 1½in. long at apex; petioles 4in. to 9in. long, channelled, complicate-sheathing at base. Borneo, 1885. (I. H. 1885, 557.)

M. Wendlandi (Wendland's). *l.* arranged in three series, oblong, acuminate, dark green on the upper surface, bronzy-green beneath; petioles blackish-green, deeply channelled. 1885. An ornamental foliage plant. SYN. *Pandanophyllum Wendlandi.*

M. argentea (silvery). *l.* large, oblong, acute, silvery-grey, marked with narrow, curving lines of a deep green. Brazil, 1884.

M. conspicua (conspicuous). *l.* oblong-ovate, dark green above, pinnately marked with broken, distant bands of pale yellow-green, purplish beneath. Brazil, 1885. A small species.

M. gratiosa (favoured). *l.* broadly oblong, sub-cordate, silvery-grey, the midrib and five or six tapering, curved bands on each side of it of a bright green. Brazil, 1884.

M. iconifera (picture-bearing). *l.* about 6in. long, obliquely ovate, yellowish-green, marked with oblong, deep green blotches. Brazil, 1887.

M. musaica (mosaic). *l.* obliquely cordate, 7in. long, 3½in. broad, bright, glossy green, marked with numerous close-set, transverse veins. Brazil, 1884.

M. nitida (shining). *l.* oblong, acute, 6in. long, 3in. broad, pale, bright, shining green, with four or five oblong, green patches on each side of the midrib. Brazil, 1884.

M. polita (neat). *l.* 4in. to 5in. long, 2in. broad, glossy green, elegantly marked with stipitate, oblong, dark green blotches. Brazil, 1884.

M. speciosa (showy). *l.* obliquely elliptic-oblong, acute, bright green, pinnately banded with greenish-white. Brazil, 1884.

MARCGRAVIA INDICA. The plant catalogued by nurserymen under this name is probably a Pothos.

MASDEVALLIA. *M. Dayana*, *M. gracilenta*, and *M. hypodiscus* are now referred to **Cryptophoranthus** (which *see*). To the species, varieties, and hybrids described on pp. 332-5, Vol. II., the following should now be added:

M. acrochordonia (belted above). *fl.* much as in *M. ephippium*, six to fifteen to a peduncle; sepals having numerous warts on the upper surface; petals acuminate; lip much narrower than in *M. ephippium*, with an undulated, median keel on the upper part, and an acuminate top. Ecuador, 1885.

M. astuta (cunning). *fl.*, sepals brown outside, with the centre and apex yellow, internally ochreous, spotted brown, hispid, triangular, the tails brown; lip pale yellowish, saccate, with three keels; peduncle about as long as the leaves. *l.* oblong, acute, 6in. to 8in. long. Costa Rica, 1886. Allied to *M. Gaskelliana*.

M. Boddaërtii (Dr. Boddaërt's). *fl.* solitary, about 2½in. long and 2in. to 2½in. broad, very flat, on tall peduncles; sepals yellow, gradually passing to bright crimson-scarlet mottled with yellow, the dorsal one decurved, filiform, the lateral ones ovate, acute, not tailed. April and May. *l.* leathery, lanceolate-obovate, with sheathing, truncate scales at base. New Grenada. SYN. *M. ignea Boddaërtii* (I. H. ser. iii. 357).

M. candida (white). A synonym of *M. tovarensis*.

M. Carderi (Carder's). *fl.* remarkably fleshy and soft; tails yellow, spotted blackish-purple, long; perianth short, cup-shaped, whitish inside, ochre-orange at base, bearing a blackish-mauve-purple zone between the two areas, the free, triangular portions short, the inside covered with rusty hairs. 1883. (G. C. n. s., xx., p. 181.)

M. Colibri (humming-bird). A synonym of *M. ephippium*.

M. demissa (depressed). *fl.*, free lacinia of the upper sepal triangular and very short, the tail dark yellow, the lateral sepals brownish-purple, connate, rounded outside, with two strong, yellow tails; petals brown, small; lip brown, narrow, cordate-triangular, acute; column white; peduncle one-flowered, much shorter than the leaf. *l.* very thick, cuneate-spathulate. Costa Rica, 1887.

M. elephanticeps (elephant's-head). *fl.* solitary, horizontal, 3in. to 4in. long, somewhat resembling an elephant's head, the tubular portion of the perianth produced into a chin at the lower base, and, as well as the lower sepals, dark crimson-purple, pale purple outside, united for one-third their length, the tails yellow inside; upper sepal bright yellow, the three-cornered basal part gradually narrowing into the yellow tail; peduncles 1ft. high. *l.* tufted, cuneate-spathulate, acute. New Grenada. (F. d. S. 997; R. X. O. i. 3.) The variety *pachysepala* (R. X. O. 74, f. 3-4) has the tails of the sepals broader.

M. Gairiana (Gair's). *fl.* bright yellow, studded with crimson papillæ. A hybrid between *M. Davisii* and *M. Veitchiana*. 1887.

M. Geleniana (Baron Hruby von Geleneye's). *fl.*, upper sepal orange, at first dotted purple, the lateral ones much lighter, with sulphur borders; tails sulphur, very long; petals sulphur, ligulate, three-toothed; lip thickly purple-spotted, rather large, membranous, oblong, slightly lobed on each side; column whitish, dotted purple, stout. *l.* 1¾in. long, 1¼in. broad, very stiff, petiolate. 1887. A hybrid between *M. xanthina* and *M. Shuttleworthii*.

M. glaphyrantha (hollow-flowered). *fl.*, tube pale outside, short, bordered by the overlapping margins of the purple free laciniæ, the tails yellow; petals ligulate, emarginate, retuse; lip purple at base, with two purple stripes in front, ligulate. 1886. Hybrid.

M. Hincksiana (Capt. Hincks'). *fl.*, tube white, short, slender; middle sepal light ochre, orange at top, running out in a declined, ochre tail, the lateral ones light ochre, with short, orange tails; petals ligulate; lip ligulate, acute, with two short keels. 1887. A hybrid between *M. ignea* and *M. tovarensis*.

M. ignea aurantiaca (orange). *fl.* bright orange, veined vermilion. New Grenada.

M. i. Boddaërtii (Boddaërt's). A synonym of *M. Boddaërtii*.

M. i. grandiflora (large-flowered). *fl.* circular, of great substance; lateral sepals bright vermilion, lined crimson and suffused purple. New Grenada.

M. i. Massangeana (Massange's). *fl.* bright orange-vermilion, flushed rosy-purple, large. New Grenada.

M. Lindeni armeniaca (apricot-colour). *fl.* of a rich, deep apricot-colour, veined flame-red, and having a yellow mouth to the tube. Columbia, 1886. (W. O. A. 224.)

M. L. atrosanguinea (dark bloody). *fl.* large; lateral sepals crimson, flushed magenta, nearly 1in. wide, the points falcate-lanceolate, nearly meeting. New Grenada. (W. O. A. iii. 105.)

M. L. cœrulescens (bluish). *fl.* large; lateral sepals magenta-crimson, flushed bluish-purple, broadly semi-ovate, apiculate. New Grenada. (W. O. A. i. 24.)

M. L. grandiflora (large-flowered). A variety with large, rich rosy-purple flowers. Columbia, 1886. (L. 34.)

Masdevallia—*continued.*

M. L. imperialis (imperial). *fl.* nearly 3in. across; sepals glowing crimson-magenta, deepening towards the tails, broad and spreading. 1882.

M. L. læta (pleasing). *fl.* bright rosy-purple, distinctly striped, large, much narrowed at the upper part, and having the margins slightly undulated. New Grenada.

M. L. lilacina (lilac). *fl.* bright rosy-lilac, broad, almost circular. New Grenada.

M. L. miniata (scarlet). *fl.*, lateral sepals bright vermilion, flushed scarlet, with a distinct, yellow eye, the principal ribs marked out with crimson lines. New Grenada, 1883. (W. O. A. iii. 110.)

M. L. sanguinea (bloody). *fl.* brilliant reddish-crimson, flushed orange, large. New Grenada.

M. L. splendens (splendid). *fl.* intense mauve-magenta, with crimson veins, broad. New Grenada.

M. L. versicolor (various-coloured). *fl.* rich magenta, margined or otherwise irregularly marked with rich maroon-crimson, freely produced. 1882. Also known as *striata*.

M. militaris (military). This is distinguished from *M. ignea* "by its exceedingly stiff, dark green leaf, of great substance, standing on a petiole shorter than the blade, by a thicker peduncle, a much wider flower tube, and a wider limb, the first yellow, the limb cinnabarine, now partly yellow; the lip much broader and shorter" (Reichenbach). New Grenada

M. pusiola (rather dwarf). *fl.* light sulphur, small, deeply slit; free part of the sepals equal in length to that of their tails; petals bilobed at apex, one lobe being bent forwards; lip unguiculate, auriculed on each side at the base, the anterior blade oblong-sagittate. *l.* tufted, lanceolate, 1in. long. United States of Columbia, 1887. The smallest Masdevallia yet known.

M. Roëzlii rubra (red). *fl.* creamy-yellow, transversely mottled inside with dark chocolate-red, large, having chocolate tails 3in. to 4in. long. Columbia, 1886. (W. O. A. 243.)

M. senilis (senile). *fl.* reddish-brown, covered inside with short, yellow hairs, comparatively small; petals white, with mauve-brown spots; lip pale purple and white. 1885. Allied to *M. Chimæra*.

M. sororcula (little sister). *fl.* greenish outside; middle sepal pale, lined purple, the lateral ones purple, with greenish tails; petals white, with a purple mid-line, the purple side lobes and disk with a red mid-line and white adjacent areas; peduncle one-flowered. *l.* ligulate, acute, leathery. 1887.

M. striatella (slightly striated). *fl.* small; perianth white, striped cinnamon, going off into three short tails; petals with a brown mid-line, lanceolate, with an angle on the lower side; lip yellow at base and apex, and with three purple nerves, lanceolate, acute, angular at base. *l.* about 5in. long, rather thick, cuneate-oblong, blunt. 1886.

M. velifera (sail-bearing). *fl.* greenish-yellow, shaded brown, the tails clear, dark yellow; odour unpleasant. Habit and growth as in *M. coriacea*. (G. C. ser. iii., vol. i., p. 744.)

M. Wallisii stupenda (stupendous). *fl.* light sulphur, spotted with chocolate, very large, having chocolate tails. 1885. A grand variety. (G. C. n. s., xxiii., p. 473.)

M. Wendlandiana (Wendland's). *fl.* white, tubular, solitary, ¾in. long, the tails equal to the free, triangular bodies; chin short; lip having an orange area before the apex, and very numerous small, dark purple spots; column white, with three mauve stripes. *l.* densely massed, spathulate, minutely bilobed. New Grenada, 1887.

MATRICARIA. To the variety described on p. 337, Vol. II., the following should now be added:

M. eximia pyramidalis (choice, pyramidal). A garden form, of compact and somewhat pyramidal habit. 1886. Hardy annual or perennial. (R. H. 1886, p. 557, f. 131.)

MAXILLARIA. To the species described on pp. 338-9, Vol. II., the following should now be added:

M. Endresii (Endres'). *fl.*, sepals and petals light ochreous, triangular-ligulate, acuminate, aristate; lip ochre, with a yellow disk, and purple borders and veins on the side lobes; callus triangular, depressed; peduncle rather short. *l.* cuneate-ligulate, blunt-acute. Pseudo-bulbs very broad, elliptic. 1886.

M. fucata (painted). *fl.*, sepals and petals white outside, white inside at base, purple in the middle, yellow at apex, the sepals spotted red at apex, triangular, the lateral ones broadest, with reflexed tips, the petals rhomboid, blunt-angled at the sides; lip ochreous, striped brown, oblong-elliptic, trifid in front, the side lobes rounded, margined brown, the mid-lobe small, semi-oblong, emarginate; peduncles 9in. long, with many sheaths. *l.* oblong-lanceolate, acuminate, 8in. to 9in. long; petioles 5in. to 7in. long. 1886. Allied to *M. irrorata*.

M. Harrisoniæ (Mrs. Harrison's). A synonym of *Bifrenaria Harrisoniæ*.

M. Hübschii (Hübsch's). *fl.* white; lateral sepals much rounded, like a goitre; petals linear-rhombic, acute; lip transverse, rhombic, with a yellow, emarginate callus on the disk, a mauve-purple margin inside, and a few dots and blotches at the base outside; column white, with mauve stripes in front. 1888. Allied to *M. fucata*.

Maxillaria—*continued.*

M. Kalbreyeri (Kalbreyer's). *fl.*, sepals and petals greenish-white, the upper sepal and petals ligulate, the lateral sepals triangular, acute; lip greenish-white, marked mauve-purple on the outer margins, oblong-ligulate, blunt, toothleted on the anterior margins, a little broader towards the base. *l.* oblong-ligulate, 9in. high, 1in. broad. Pseudo-bulbs about 2in. long and 1in. broad. New Grenada, 1885.

M. Lehmanni (Lehmann's). *fl.* white; side lobes of the lip light reddish-brown and covered with fragile hairs inside, pale ochre with dark chestnut veins outside, the front lobe sulphur, triangular, wavy. 1886. A showy species.

M. macrophylla (large-leaved). A synonym of *Lycaste macrophylla.*

MELOCACTUS. To the species described on p. 348, Vol. II., the following should now be added:

M. latispinus (broad-spined). A synonym of *Echinocactus cornigerus.*

M. Miquelii (Miquel's). *fl.* unknown. Stem oval, dark green; ribs fourteen, well defined; spines in small tufts of about nine, short, blackish-brown, less than ½in. long, one central, the others radiating; cap cylindrical, 3in. high, 14in. in diameter, composed of layers of snow-white threads, mixed with short, reddish bristles. St. Croix, West Indies. See Fig. 42.

MESEMBRYANTHEMUM. To the species described on pp. 355-60, Vol. II., the following should now be added:

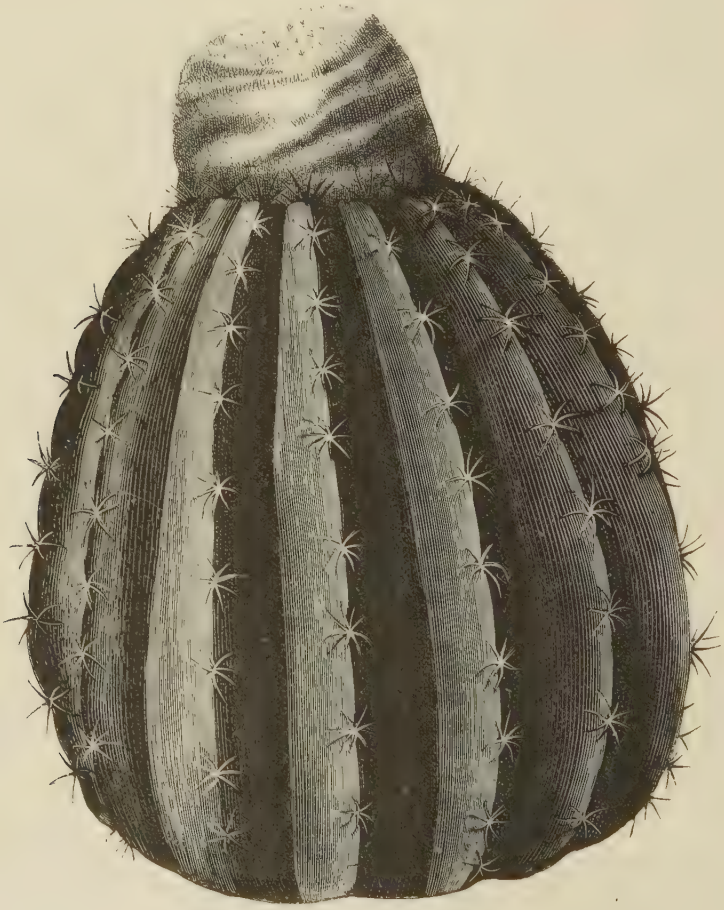

FIG. 42. MELOCACTUS MIQUELII.

M. molitor (producer). *fl.* dingy yellow; sepals tinged brown, acute, the lateral ones narrower; petals smaller, oblong-lanceolate, often reflexed at top; lip marked brown, trifid, the mid-lacinia triangular, blunt, wavy, the side ones rounded; column yellow, with red spots in front. *l.* and pseudo-bulbs as in *M. grandiflora.*

M. præstans (excelling). *fl.*, sepals and petals honey-yellow, the former ligulate, acute, the latter narrow, shorter, acuminate or blunt-acute; lip trifid, the basilar laciniæ whitish, with purple spots, the mid-lacinia brownish-yellow, very thick, cuneate-oblong, acute; column yellow, spotted purple. *l.* cuneate-ligulate, blunt-acute. Pseudo-bulbs oblong, ancipitous, with convex sides. Guatemala, 1884.

M. Sanderiana (Sander's). *fl.* ivory-white, 4in. to 5in. across, the bases of the sepals and petals and the outside of the lip dark vinous-crimson, the inside of the lip yellowish, with vinous-crimson spots. *l.* stalked, broadly oblong, obtuse, apiculate. Pseudo-bulbs compressed, one-leaved. Peru, 1887.

M. Brownii (Brown's). *fl.* at first brilliant lustrous purple, fading into ochreous or reddish-yellow, 1in. to 1¼in. in diameter, solitary or in threes at the ends of the branches; calyx tube short, turbinate; petals in several series, very narrowly spathulate, the lip obtuse, retuse, or notched. July. *l.* six to eight lines long, terete, acute, pale glaucous-green; youngest ones obscurely triquetrous or semi-terete. Branches slender. *h.* 1ft. South Africa. (B. M. 6985.) SYN. *M. micans*, of gardens.

M. micans (glittering), of gardens. A synonym of *M. Brownii.*

MESOSPINIDIUM. Three species formerly included here are now referred to **Cochlioda** (which *see*).

METROSIDEROS. To the species described on p. 361, Vol. II., the following variety should now be added:

M. floribunda alba (bundle-flowered, white). *fl.* pure white.

MICROPHŒNIX (from *micros*, small, and *Phœnix*; in allusion to the habit of the plants, and their affinity to *Phœnix*). ORD. *Palmæ*. The two following hybrids are the only plants that have been described under this name. They will probably thrive under the treatment recommended for **Phœnix** (which *see*, on pp. 103-4, Vol. III.).

M. decipiens (deceptive). According to Carrière, this name was given by Naudin to a hybrid, obtained by a horticulturist at Hyères, between the common Date Palm (*Phœnix dactilifera*) and the dwarf Fan Palm (*Chamærops humilis*).

M. Sahuti (Sahut's). *fr.* reddish-brown, about ⅔in. long, ellipsoid, with rounded angles. 1885. A garden hybrid between *M. decipiens* and *Trachycarpus excelsus*, having the habit and foliage of the former, and the violet-tinted petioles and fruits of the latter. Hardy. (R. H. 1885, p. 513, f. 91.)

MICROSTYLIS. To the species described on p. 364, Vol. II., the following should now be added:

M. bella (pretty). *fl.* dull purple, disposed in an elongated raceme; sepals and petals linear-ligulate; lip long, sagittate, sub-equally toothed at apex. *l.* ample, cuneate-oblong, acute, undulated. Pseudo-bulbs conical-cylindrical. Sunda Islands, 1885. (I. H. 1885, 581.)

M. Lowi (Low's). *fl.* purple, the ears of the sagittate lip ochreous; peduncle rosy-purple. *l.* dark coppery-brown, marked with a broad, whitish, central band, the margins undulated. Borneo, 1885. A beautiful little plant. (B. H. 1884, 14, f. 2.)

M. purpurea (purple). *fl.* yellowish-purple. *l.* broadly ovate, 4in. to 5in. long, 2in. broad or more, much undulated, the upper surface dark metallic-crimson, the under surface and petioles pale metallic reddish-grey. Ceylon. A fine species.

MILTONIA. To the species and varieties described on pp. 367-70, Vol. II., the following should now be added:

M. bicolor (two-coloured). A variety of *M. spectabilis*.

M. Bluntii Lubbersiana (Lubbers'). *fl.*, sepals and petals chestnut-spotted; lip very fine purple. 1887.

M. Moreliana (Morel's). A variety of *M. spectabilis*.

M. Peetersiana (Peeters'). *fl.* resembling those of *M. spectabilis Moreliana*, but the purplish-brown sepals and petals are narrower and more acute; lip narrower at the base, and dilated suddenly and acutely at the tip, rich purple, with five unequal, yellow keels at the base, the base and inside line of the disk occupied by numerous dark purple, pale-edged blotches. *l.* (and pseudo-bulbs) as in *M. Clowesii*. 1886. A handsome plant.

M. P. concolor (one-coloured). A beautiful variety, with paler sepals and petals, and lacking the dark eye-spots on the lip. 1886.

M. spectabilis aspersa (sprinkled). *fl.*, sepals and petals cream-coloured, partly washed with mauve-lilac; lip light mauve-lilac, with a large keel. 1885.

M. s. lineata (lined). *fl.* having a large, purple blotch at the base of the lip, and seven purple veins radiating therefrom nearly to the margins.

M. s. Moreliana atrorubens (dark red). *fl.* much darker than in *Moreliana*, often measuring 4in. across. September. Brazil. A scarce plant.

M. s. radians (radiating). *fl.*, petals tinted with very light purple, and covered with the warmest dark purple stripes, between which at the base there are some yellow stripes. 1887.

M. vexillaria alba (white). A beautiful, white-flowered variety. 1885. SYN. *Odontoglossum vexillarium album* (W. O. A. 227).

M. v. Cobbiana (Cobb's). *fl.*, upper portion of the usual deep rose-pink, the large, expanded wings of a pure white. 1882.

M. v. Hilliana (Hill's). *fl.*, sepals and petals rose, the equal sepals having two purple lines; lip spotted purple, margined rose, the base yellow, with three dark purple lines. New Grenada.

M. v. insignis (remarkable). *fl.* fine and richly coloured; lateral sepals having two parallel, crimson lines at the base; lip deep purplish-red, having a whitish basal area lined with crimson, and a band of bright yellow across the base. 1885.

M. v. Kienastiana (Kienast's). *fl.* very large; sepals and petals with a rose-coloured disk, and broad, white margins; lip light yellow at the very base, with three central purple lines, and having fine, rose-coloured, radiating lines all over it except on the pure white margin. 1885. A magnificent variety.

M. v. leucoglossa (white-lipped). *fl.*, sepals and petals pale rose; lip pure white. New Grenada. A striking variety.

M. v. Measuresiana (Measures'). *fl.* of a purer white and smaller than those of the variety *alba*. 1885.

M. v. purpurea (purple). *fl.* rose-purple, the base of the lip white with the usual red lines. 1885. SYN. *Odontoglossum vexillarium purpureum* (L. i. 13).

Miltonia—*continued.*

M. v. rosea (rosy). *fl.* of a deeper rose-colour than in the type.

M. v. rubella (reddish). *fl.* bright rose, with three crimson lines at the base of the lip. *l.* broader than usual. Pseudo-bulbs more blunt than in the type. 1882.

M. v. splendens (splendid). *fl.* intense rose, coloured to the margins, 4in. to 4½in. in diameter; lateral sepals having a crimson stripe at base; lip with three short, radiating stripes below the calli. New Grenada.

M. v. superba (superb). *fl.*, sepals and petals rose, the former having a purplish-crimson stripe at base; lip magenta-rose, the white area at the base having a large, dark crimson-purple blotch veined with darker, radiating lines. Autumn. New Grenada. SYN. *Odontoglossum vexillarium superbum* (W. O. A. iv. 171).

M. Warscewiczii alba (white). *fl.* having a broad, white lip, marked in the centre with a conspicuous, lilac blotch. 1882.

M. W. xanthina (yellowish). *fl.* almost wholly yellow, the lip having a narrow, white border. Winter. Peru.

MIMULUS. To the species described on pp. 370-1, Vol. II., the following should now be added:

M. mohavensis (Mohave River). *fl.*, calyx tube ½in. long; corolla whitish, with a dark crimson eye, the stout tube scarcely longer than the calyx, the limb much spreading, ½in. in diameter. Summer. *l.* oblong-lanceolate, acute, entire, reddish. *h.* 2in. to 3in. California, 1886. A pretty little, minutely viscous-pubescent, hardy annual.

MOLTKIA. To the species described on p. 376, Vol. II., the following should now be added:

M. graminifolium (Grass-leaved). *fl.* deep blue, drooping, disposed in terminal clusters; scape 6in. to 12in. long, wiry June to August. *l.* tufted, Grass-like. Northern Italy, &c.

MOMORDICA. To the species described on pp. 376-7, Vol. II., the following should now be added:

M. involucrata (involucred). *fl.*, males pale yellowish, with three green spots on the short tube, solitary in the upper axils; females few, with revolute lobes. July. *fr.* scarlet, fleshy, 2in. long. *l.* 1½in. to 2in. in diameter, five-lobed, the lobes toothed; petioles slender, ¼in. to 1in. long. Natal. (B. M. 6932; Ref. B. iv. 223.)

MORINA. To the species described on p. 383, Vol. II., the following should now be added:

M. betonicoides (Betony-like). *fl.* sessile; involucre bristly; corolla bright rose-red, crimson at the bases of three or four of the lobes, the limb ½in. in diameter; spikes sub-capitate, subtended by opposite bract-leaves tinged with red. June. *l.* 4in. to 8in. long, linear-lanceolate, acute, entire, with very long prickles on the margins. Stem erect or sub-erect, 10in. to 18in. high. Sikkim-Himalaya, 1883. Hardy rock plant. (B. M. 6966.)

MORMODES. To the species described on pp. 384-5, Vol. II., the following species and varieties should now be added:

M. buccinator majus (larger). *fl.* ochre, larger than in the type; sepals and petals numerously dotted cinnamon; lip with a few pale markings on the sides. New Grenada.

M. Dayanum (Day's). *fl.* as large as those of *M. Wendlandi*; sepals and petals ochre, with red, longitudinal lines inside; lip white, revolute, so that the outsides of both halves touch, triangular, with a short, inflexed apiculus in the middle; column white, small, apiculate; raceme few-flowered. 1885.

M. luxatum eburneum (ivory-like). *fl.* wholly ivory-white. 1886. (I. H. ser. v. 35.)

M. l. punctatum (dotted). *fl.* whitish, the sepals and petals marked with small, reddish spots. 1885.

M. l. purpuratum (purple). *fl.* light mauve-purple, with dark purple lines and spots on the sepals and petals; side lobes of the lip much darker than the central part. 1886.

M. pardinum melanops (dark-looking). *fl.* very dark brownish-purple. 1886.

M. platychila (broad-lipped). *fl.* pale buff, upwards of 1in. in expanse; lip marked with many dull purple stripes; racemes compact, erect. 1887. A distinct-looking species.

M. vernixium (varnished). *fl.* blackish-purple; sepals and petals broad, shining; lip having the mid-line a little lighter, with blackish-purple spots; column light mauve-purple, with numerous dark spots. Guiana, 1887. Allied to *M. buccinator*.

MUSCARI AZUREUM. A synonym of **Hyacinthus azureus** (which *see*).

MUSSÆNDA. To the species described on p. 401, Vol. II., the following should now be added:

M. erythrophylla (red-leaved). *fl.* three or four, sulphur-yellow, funnel-shaped, borne on short pedicels; bracts dazzling scarlet, roundish-ovate, 3½in. long, 3in. broad. *l.* opposite, roundish-ovate, bright green. Congo, 1888. A shrub, wholly covered with silky pubescence.

MUTISIA. To the species described on p. 401, Vol. II., the following should now be added:

M. breviflora (short-flowered). *fl.-heads* 1in. in diameter; ray florets orange-red, ¾in. long, nearly ¼in. broad, obtuse; disk yellow. *l.* pale green, ovate-oblong, retuse or emarginate, cordate at base, 2½in. long, 1½in. broad, the margins armed with somewhat distant, spiny teeth, the midrib produced into a tendril. Chilian Andes, 1885. Greenhouse, scrambling shrub. (R. G. 1163, f. 1.)

M. versicolor (various-coloured). *fl.-heads*, ray florets orange, banded with dark brown, 1½in. long, ⅛in. broad, linear, spreading; disk yellow; involucre cylindrical. *l.* linear-subulate, armed, revolute-margined, rigid, produced in a short, reddish tendril. Stem terete, striated, flexuous, wingless. Chilian Andes, 1884. (R. G. 1163, f. 2.)

M. viciæfolia (Vetch-leaved). *fl.-heads* orange, showy; involucre long, cylindrical. *l.* pinnate, ending in a tendril; leaflets numerous, lanceolate, acute, glabrous. Peru, 1887. A handsome, greenhouse climber.

MYOSOTIS. To the species described on p. 403, Vol. II., the following varieties should now be added:

M. alpestris elegantissima (most elegant). A pretty, dwarf, free-flowering variety, having white, rose, and blue flowers. 1883. (R. H. 1882, p. 20.)

M. dissitiflora alba (white). *fl.* pure white, without the slightest taint of colour. 1883.

M. d. grandiflora (large-flowered). *fl.* double the size of those of the type, and produced in great profusion in February. 1886. Garden variety.

M. d. perfecta (perfect). A very large and finely formed variety. 1883.

M. sylvatica grandiflora (large-flowered). A variety having flowers nearly ½in. across. 1885. (R. G. 1885, p. 121.)

MYRIOCARPA (from *myrios*, myriad, and *karpos*, fruit; alluding to the numerous fruits). ORD. *Urticaceæ*. A genus embracing six species of stove shrubs or small trees, inhabiting tropical America, from Brazil to Mexico. Flowers dicœcious, rarely monœcious, scattered at the sides of the filiform branches of the rachis, the males often sessile and densely clustered, the females looser, sessile or pedicellate, often very numerous; spikes or racemes solitary or somewhat fascicled at the axils or nodes, often branched. Leaves alternate, usually ample, petiolate, toothed, penniveined and about three-nerved. Two species are known in gardens. Where room can be spared, they will make a bold and effective appearance. They thrive in good, well-drained loam, and may be propagated by cuttings of the young wood.

M. colipensis (Colipa). *fl.*, female inflorescence consisting of pendulous, forked spikes, 1½ft. to 2ft. long, densely covered with small, flask-shaped ovaries. *l.* 1½ft. to 1½ft. long, 11in. broad, elliptic, acute, rounded at base, crenate on the margins, clothed with rigid hairs, adpressedly pubescent beneath; petioles 10in. to 12in. long. Mexico, 1887. A shrub or small tree.

M. stipitata (stalked). *fl.*, females more or less clustered; males sub-sessile, glomerulate; primary branches of the inflorescence short, the ultimate ones sometimes shorter than the leaves. *l.* ovate- or obovate-elliptic, or rarely elliptic-lanceolate, 4in. to 7in. long, shortly acuminate at apex, rounded or obtuse, very rarely sub-cordate at base, unequally serrate-denticulate or crenulate. Mexico, Venezuela, &c. A shrub or small tree.

MYRMECODIA (from *murmex*, *murmekos*, an ant; in allusion to those insects making their habitation in the rhizomes). ORD. *Rubiaceæ*. A genus of about a score species of stove, epiphytal, highly glabrous, "ant-nesting" shrubs, with a smooth or prickly, tuberous rhizome, extending from Sumatra and Singapore to New Guinea, North Australia, and Solomon's Archipelago. Flowers white, small, sessile, solitary or few; calyx tube ovoid, the limb very short, entire; corolla having a cylindrical or sub-urceolate tube, and a four-lobed limb; stamens four. Leaves stalked, clustered at the tips of the branchlets,

Myrmecodia—*continued.*

opposite, narrowed to rather long petioles, coriaceous; stipules persistent, ample, bifid; branches short, quadrangular, thick and fleshy. *M. Beccarii* is in cultivation in this country. It requires great heat, and should be treated like an epiphytal Orchid. Seedling plants may be raised from its fruits.

M. Beccarii (Beccari's). *fl.*, corolla tube cylindrical, the lobes ovate, thick, longer than the tube. February. *fr.* cylindric-oblong, rounded at apex, four-stoned. *l.* oblanceolate or oblong-oblanceolate, sub-acute, fleshy. Tuber not ribbed, lobed, spinulose; spines short, simple; branches thickened-nodose. Tropical Australia, 1884. (B. M. 6883.)

MYSTACIDIUM (from *mustax*, *mustakos*, a moustache, and *eidos*, resemblance; in allusion to the pointed prolongation of the lip). SYN. *Aëranthus* (of Reichenbach, jun.). ORD. *Orchideæ*. A genus comprising about a score species of stove, epiphytal, not pseudo-bulbous Orchids, natives of tropical and South Africa. Flowers usually small, racemose; sepals and petals nearly equal, free, spreading; lip affixed to the base of the column, produced in a long, slender spur, the lateral lobes sometimes ovate, erect, sometimes nearly obsolete, the middle one erect or spreading, often ovate, undivided; pollen masses two; racemes axillary, often short. Leaves distichous, usually few, coriaceous, spreading. Stems leafy, rigid. Only one species is known in gardens. It thrives either on blocks or in baskets, in a cool house, and will succeed under conditions similar to those which suit *Angræcum falcatum*.

M. filicorne (thread-horned). *fl.* white, 1in. in diameter, numerous; sepals, petals, and lip lanceolate, acute; spur slender, 2in. long or more. *l.* narrow-oblong, 2in. to 5in. long, about ½in. broad, obtusely two-lobed at apex. Natal, 1887. A pretty, free-flowering, Angræcum-like Orchid, of tufted habit. (G. C. ser. iii., vol. ii., p. 135.)

NÆGELIA. To the species described on p. 408, Vol. II., the following hybrid should now be added:

N. achimenoides (Achimenes-like). *fl.* 2in. long, 1¼in. broad, the tube yellowish-rose outside, yellow dotted rose within, the lobes light rose. 1885. A pretty hybrid between *N. zebrina* and *Achimenes gloxiniæflora*, with the habit of the former, but the flowers hang from the axils of the leaves as in *Achimenes*.

NAPOLEONA. To the species described on p. 409, Vol. II., the following should now be added:

N. cuspidata (cuspidate). This differs from the better-known *N. imperialis* in its larger flowers, which are cream-coloured with a crimson centre, regularly five-angled, with straight sides (not five-lobed as in *N. imperialis*); the leaves are much larger, being 8in. to 10in. long and 4in. to 5in. broad. 1886. (G. C. n. s., xxv., p. 657, f. 147 B.)

NARCISSUS. To the species and varieties described on pp. 411-20, Vol. II., the following should now be added:

N. cyclamineus (Cyclamen-like). *fl.*, perianth lemon-yellow, the tube very short, the segments nearly 1in. long, strongly reflexed from the base; corona as long as, or longer than, the segments, rather deeper in colour, the edge crenate; scape sub-terete, 6in. to 12in. long. Spring. *l.* two or three, linear, sub-erect, deeply channelled. Bulb ½in. in diameter. Portugal. (B. M. 6950.)

N. Johnstoni (Johnston's). A variety of *N. Pseudo-Narcissus*.

N. Jonquilla Burbidgei (Burbidge's). A variety having the corona cut into six segments nearly to the base. Native country unknown. 1885.

N. juncifolio-muticus (hybrid). *fl.* three, on a slender, terete peduncle, the two upper ones ascending, the lower one horizontal; perianth tube greenish-yellow, ⅜in. long, the expanded limb bright lemon-yellow, horizontal, 1½in. in diameter, the segments ovate-oblong, much imbricated; corona orange-yellow, obconical, ½in. long. Latter end of April. *l.* narrow-linear, channelled. 1886. Probably a hybrid between *N. juncifolius* and *N. Pseudo-Narcissus muticus*.

N. poeticus biflorus (two-flowered). *fl.* double, two on each scape. 1885. A fine variety. (R. G. 1193.)

N. Pseudo-Narcissus Johnstoni (Johnston's). *fl.* pale sulphur, remarkable for the long and rather slender corona tube, which is about ⅜in. long, and less spreading at the mouth than in the common Daffodil. Portugal, 1887.

N. P.-N. muticus (curtailed). *fl.* 1in. to 1½in. long; tube obconical ½in. long and broad; segments sulphur-yellow, 1in. to 1½in. long;

Narcissus—*continued.*

corona deep lemon-yellow, as long as the segments, ¾in. in diameter at the very truncate throat. Pyrenees.

N. Sabinii (Sabine's). *fl.* solitary, drooping; perianth tube green, cylindrical, somewhat funnel-shaped; segments whitish, shining, broad, imbricated, ovate; corona yellow, plaited, ⅜in. long, erose; scape ancipitous, channelled. Spring. *l.* pale green, broad, few. This has been lately re-introduced by Mr. Barr. (B. R. 762.)

N. scaberulus (slightly scabrous). *fl.*, perianth yellow, ½in. to ⅝in. across, stalked, bent; tube greenish, ½in. to ⅝in. long; segments ovate, imbricated, the three inner ones broadest, apiculate, slightly fringed at tips, spreading, ultimately slightly reflexed; corona about ¼in. across, cup-shaped, more or less crenate; scape 2½in. to 4in. long, one or two-flowered. March and April. *l.* two, linear, more or less prostrate, longer than the scape, slightly furrowed above, two-angled beneath. Bulb small. Oliviera do Conde, Portugal.

Garden Varieties. These hardy, garden flowers have become great favourites during recent years. The numerous hybrid forms raised in gardens are excellent subjects for pot culture, and form a pleasing feature in the greenhouse and conservatory. Under the three following names are given descriptions of what may be regarded as the types of three distinct groups of garden Narcissi. The numerous named forms of each will be found described in the catalogues of specialists; but a few of the more recent and desirable varieties in the various sections are here briefly noticed.

Types of Garden Narcissi.

N. Barrii (Barr's). *fl.* horizontal or ascending; perianth tube greenish, sub-cylindrical, 1in. long; segments pale sulphur-yellow, oblong, spreading horizontally, slightly imbricated when fully expanded, 1½in. long, ⅝in. broad at the middle; corona lemon-yellow below, orange-yellow at the throat, obconical, ¼in. long, ⅜in. broad at the throat, crenulate, strongly plicate in the upper half; stamens all six opposite the base of the corona; style just overtopping the anthers; ovary oblong-triangular, ⅛in. long; peduncle ancipitous, one-flowered, about 1ft. long; pedicel and spathe as in *N. incomparabilis*. *l.* linear, twisted, glaucous, above 1ft. long, ¼in. broad. No doubt a hybrid between *N. incomparabilis* and *N. poeticus*, the former predominant.

N. Burbidgei (Burbidge's). *fl.* horizontal or ascending; perianth tube green, cylindrical, 1in. long; segments pure white, spreading horizontally, not imbricated, oblanceolate-oblong, cuspidate, 1¼in. long, ½in. broad; corona obconical, ¼in. long, ¼in. broad at the throat, very plicate, crenulate, the base yellow, the edge bright red; anthers and stigma placed in the corona; ovary oblong-triangular, ⅛in. long; peduncle one-flowered, ancipitous, 1ft. long; pedicel and spathe as in *N. poeticus*. *l.* linear, glaucous, twisted, above 1ft. long, ⅛in. to ¼in. broad. No doubt a hybrid between *N. poeticus* and *N. incomparabilis*, the former element strongly predominating.

N. Leedsii (Leeds'). *fl.* about horizontal; perianth tube greenish, cylindrical, ⅜in. long; segments milk-white, spreading, oblanceolate-oblong, cuspidate, 1in. to 1¼in. long, ½in. to ⅝in. broad at the middle, not imbricated; corona pale sulphur-yellow, ¼in. long, ½in. in diameter at the throat, plicate in the upper half, crenulate at the erect margin; anthers all six placed opposite the base of the corona; style overtopping the anthers; ovary oblong-triangular, ⅛in. to ¼in. long; peduncle one-flowered, ancipitous, a little longer than the leaves; pedicel 1in. long; spathe one-valved, membranous, clasping the pedicel and ovary. *l.* linear, twisted, glaucous, 1ft. long, ¼in. broad. Probably a hybrid between *N. poculiformis* and some form of *N. incomparabilis*.

Group I. Magnicoronati (*Ajax, or Pseudo-Narcissus*).

TRUMPET DAFFODILS—GOLDEN.

Ard Righ, or **Yellow King.** Trumpet deep yellow, large. Distinct and early.

Automedon. Trumpet deep, rich yellow, large. Very handsome.

Golden Spur. Perianth large; trumpet rich yellow, large. Very handsome.

P. R. Barr. Perianth yellow; trumpet rich, deep yellow.

TRUMPET DAFFODILS—TWO-COLOURED.

Harrison Weir. Perianth white; trumpet pale yellow. Handsome.

James Walker. Perianth cream-colour; trumpet yellow. Large and handsome.

Murrell Dobell. Perianth whitish, well-formed trumpet yellow.

Narcissus—*continued.*

TRUMPET DAFFODILS—WHITE OR SULPHUR-COLOURED.

Asturicus. A very early form of the white Spanish Daffodil. It flowered with Messrs. Barr, at Tooting, a fortnight before *pallidus præcox*.

Bishop Mann. A tall-growing form of *cernuus*, found in an old Irish garden.

Duchess of Connaught. Perianth primrose, well-formed. Very pretty.

Lady Grosvenor. Perianth white; trumpet cream-coloured. Very distinct.

Madame de Graaff. Perianth of the largest size; trumpet white. A splendid variety.

Marchioness of Lorne. Perianth pale primrose; trumpet a shade darker, recurved.

Group II. Mediocoronati.

INCOMPARABILIS (NONSUCH PEERLESS DAFFODILS—*pallidus*).

Prince Teck. Perianth creamy-white, large, and well-opened.

BARRII (BARR'S PEERLESS HYBRID DAFFODILS—*albidus*).

Dorothy E. Wemyss. Perianth white, with large, open, pale yellow cup, edged orange-scarlet.

Group III. Parvicoronati.

BURBIDGEI (BURBIDGE'S POETICUS DAFFODILS, WITH SAUCER-SHAPED CUP).

Ellen Barr. Perianth white; cup pale yellow, stained orange.

Mercy Foster. Perianth white; cup canary-yellow, frilled.

POETICUS (PURPLE-RINGED POET'S DAFFODILS).

Grandiflorus. Perianth pure white, large; cup tinted crimson.

POLYANTHUS NARCISSUS (BUNCH-FLOWERED DAFFODILS).

The varieties of these grown in the Dutch gardens are very numerous; but only those with stout stems and large heads of well-formed flowers are worth growing.

Eldorado. Perianth sulphur; cup orange; truss large.

Golden Ear. Perianth sulphur-yellow; cup orange-yellow, large; truss very large.

Grand Primo. Perianth pure white; cup citron; truss large.

Grand Sultana. Perianth white; cup deep yellow, large, expanded.

Mercurius. Perianth primrose; cup rich orange; truss very large.

Princess of Teck. Perianth white; cup orange; truss large.

Princess of Wales. Perianth pure white; cup deep orange; truss large and handsome.

Queen of the Netherlands. Perianth pure white, fine; cup yellow; truss large and bold.

Soleil d'Or. Perianth clear yellow; cup rich orange; truss medium.

White Pearl. Perianth pure white. A very pretty variety.

NEPENTHES. To the species and hybrids described on pp. 435-9, Vol. II., the following should now be added:

N. amabilis (lovely). Pitchers mottled with dark crimson, freely produced. 1886. A garden hybrid between *N. Hookeri* and *N. Rafflesiana*, of good habit; it bears closer resemblance to the former parent.

N. compacta (compact). Pitchers produced in abundance, about 5in. long and 8in. in circumference, reddish-purple, sometimes shaded with violet, splashed and marbled with creamy-white, the margins and mouth creamy-white; lid spotted. 1881. A distinct variety, of compact habit.

N. Curtisii (Curtis'). *l.* sub-coriaceous, glabrous above, sparsely glandulose beneath, 8in. long. Pitchers about 8in. long, dull green, thickly mottled with purple, ascending, the throat shining; lid cordate-ovate, acute, about the size of the mouth of the pitcher, prettily marbled with purple on a pale ground. Borneo, 1887. (G. C. ser. iii., vol. ii., p. 689.)

N. cylindrica (cylindrical). *l.* spreading, broadly oblanceolate, oblong, 8in. to 12in. long, narrowed into a winged petiole. Pitchers 6in. to 8in. long, 1in. to 1½in. in diameter, pale green, with a few scattered, crimson spots and markings, cylindrical, slightly inflated below the middle; mouth frilled; lid oval, with a depressed mid-nerve, horizontal or slightly fornicate over the aperture. 1887. A hybrid between *N. Veitchii* and *N. hirsuta glabrescens*. (G. C. ser. iii., vol. ii., p. 521.)

N. excelsior (advanced). Pitchers 9in. deep, richly mottled with purple-red and chocolate-brown on a light green ground, oblong,

Nepenthes—*continued.*
rounded at base. 1883. A hybrid between *N. Rafflesiana* and *N. Hookeriana.*

Nepenthes—*continued.*
suffused with rosy-lake. A hybrid between *N. Hookeriana* and *N. Sedeni.* (I. H. ser. v. 15.)

FIG. 43. NEPHROLEPIS RUFESCENS TRIPINNATIFIDA, showing Habit and Portion of detached Frond.

N. Findlayana (Findlay's). Pitchers pale green, mottled with reddish-crimson, medium-sized, produced in profusion. 1886. Garden hybrid.

N. Henryana (Henry Williams'). Pitchers about 7in. long, reddish-purple, variegated with green; throat light green, with violet spots; mouth crimson, shaded with violet; lip round,

N. Hibberdii (Hibberd's). Pitchers blood-red, spotted with pale yellowish-green, green inside; lid green outside, indistinctly marked with dull red on the inside. 1883. Garden hybrid.

N. nigro-purpurea (dark purple). *l.* leathery, glabrescent, acute at both ends. Pitchers dull purplish-brown, marked only by a few scattered, paler spots, pouch or bag-shaped, 6in. long,

Nepenthes—*continued.*

2½in. in diameter, with a few stellate hairs; wings rather broad, fringed with teeth; mouth obliquely ovate, bordered by a rim of purple or whitish ribs; lid purple, mottled on the lower surface, ovate-oblong. Borneo, 1882. Probably of specific rank. (G. C. n. s., xviii., p. 425.)

N. Paradisæ (Paradise Nurseries). Pitchers rich crimson, marked with pale green, very much narrowed in the centre, 4in. to 5in. long, 2in. to 2½in. broad at the widest part, the edge of the throat and the inside of the lid green, the outside of the lid marked reddish. 1883. Garden hybrid.

NEPHRODIUM. To the species and varieties described on pp. 440-4, Vol. II., the following should now be added:

N. cristatum (crested). This resembles *N. Filix-mas*, but the fronds are less erect; the pinnæ less regular; the segments broader, thinner, more wedge-shaped on the lower side, much more toothed, and the lower ones sometimes almost pinnatifid, the plant then forming some approach to *N. spinulosum*, from which it differs in the much narrower frond, with the segments much broader and much less divided. *sori* large, as in *A. Filix-mas*, with a conspicuous indusium. Europe (Britain), &c. SYNS. *Aspidium cristatum, Lastrea cristata.*

N. c. floridanum (Florida). *fronds* thickish, broadly lanceolate, pinnate, 1ft. to 2ft. high; sterile ones shorter, growing in a crown from a thick, scaly rootstock. A vigorous form.

N. Hopeanum (Lieut. Hope's). *sti.* 1in. to 1¼in. long, grey, glossy, naked. *fronds* oblong-lanceolate, 1ft. long, 6in. to 7in. broad, bipinnatifid; pinnæ distant, sessile, caudate, the lower ones 3in. to 4in. long, ⅝in. to ¾in. broad, cut down to a narrow wing into ligulate-falcate, entire lobes ⅛in. broad; tip of frond like one of the pinnæ; rachis grey, slightly pubescent. *sori* crowded close to the midrib; involucre firm, persistent. Polynesia, 1883. SYN. *Lastrea Hopeana.*

N. Jenmani (Jenman's). *sti.* stout, scaly, erect. *fronds* bipinnate, about 2ft. long and 9in. to 12in. broad, densely pellucid-dotted. Jamaica, 1887. SYN. *Lastrea Jenmani.*

N. lepidum (pretty). *sti.* green, setose on the margins of the groove down the face. *fronds* ovate, acuminate; pinnæ alternate, very shortly stalked, lanceolate, acuminate, pinnatifid, the central ones longest, glabrous, with hairy midribs and setose margins. *sori* placed near the midribs on each side, with inflated, roundish-reniform, lead-coloured, hairy indusia. 1886. An elegant Fern. SYN. *Lastrea lepida.*

N. mamillosum (nippled). This species closely resembles *N. decurrens;* but the pinnæ are undivided, and the sori are so deeply immersed as to make the upper surface appear as if covered with minute nipples. Moluccas, 1886. SYN. *Sagenia mamillosa* (I. H. 1886, 598).

N. molle Sangwellii (Sangwell's). A graceful variety, of free growth, very ornamental for pots or for the rockery. 1884.

N. montanum Barnesii (Barnes'). *fronds* much narrower than in the type. A pretty variety.

N. m. coronans (crowned). A finely crested variety; the apex of the frond is developed into a large, crispy tuft, and the apices of the pinnæ have smaller, roundish, crispy ones. 1882.

N. prolificum (prolific). *fronds* rigid, deltoid, bipinnate, deep green, gemmiparous in the axils of the segments and on the margins; pinnæ rather distant, obliquely ovate-lanceolate, the posterior side most developed; pinnules unequal, but usually linear, acute, and somewhat falcate. *sori* numerous, large, reniform, distributed over the whole back of the frond, covered by prominent indusia. Japan, 1883. An interesting, hardy, evergreen Fern.

N. Richardsi multifida (much-cleft). A fine, free-growing, crested variety, useful for decorative purposes.

N. spinulosum dilatatum dentigera (tooth-bearing). *fronds* slender, lanceolate, 6in. to 8in. long; pinnules about 1in. long, ovate, acute, cut into two to four lobes, which have one or two short teeth. Inverness-shire, 1886. A neat and pretty variety, of dwarf habit.

NEPHROLEPIS. To the species and varieties described on pp. 444-6, Vol. II., the following should now be added:

N. Bausei (Bause's). *fronds* numerous, erect, more than 1ft. high, leafy from their base, and of a soft, bright green; pinnæ bipinnatifid. 1885. An ornamental Fern, of dense habit, suitable for basket culture. Garden variety.

N. rufescens (reddish). Of this ferruginous-tomentose variety there is a form in which the pinnæ overlap one another and are cut down, especially on the lower side, into deep, lanceolate segments, which (in the specimen figured in G. C. ser. iii., vol. i., pp. 477, 481) are merely serrated, "but in a frond which lies before us [*tripinnatifida*] are again pinnatifid" (J. G. Baker). 1887. A free-growing, handsome Fern, either for pot culture, or for planting out in a warm house. See Fig. 43, for which we are debted to Messrs. W. and J. Birkenhead.

NEPHTHYTIS. To the species described on p. 446, Vol. II., the following should now be added:

N. picturata (pictured). *l.* spreading, 6in. to 12in. long, 5in. to 9in. broad, broadly ovate-hastate, deeply cordate at base with a rhomboid sinus, cuspidate-acuminate at apex, variegated with white in a pattern resembling the tips of Fern fronds laid between the nerves; petioles 10in. to 12in. long, terete, erect, green. Congo, 1887. Stove perennial. See Fig. 44, p. 574, for which we are indebted to Mr. Wm. Bull.

NERINE. To the species and varieties described on p. 447, Vol. II., the following should now be added:

N. atrosanguinea (dark blood-coloured). *fl.* of a bright rosy-salmon, broadly campanulate, 2½in. in diameter, several in an umbel. Winter. 1883. A fine garden hybrid between *N. sarniensis Plantii* and *N. flexuosa.*

N. Cami (Dr. Cam's). *fl.* rosy-pink, distinctly flushed blue, 1½in. long, campanulate; perianth segments linear-oblong, acute; umbel of about ten flowers, emerging from two pink bracts. 1882. A hybrid between *N. curvifolia* and *N. undulata*, producing its flowers at the same time as its leaves.

N. flexuosa angustifolia (narrow-leaved). *fl.* pink; pedicels pubescent. *l.* linear, ⅛in. to ¼in. broad. 1885. A very distinct plant.

N. f. Sandersoni (Sanderson's). This differs from the type in the less-crisped perianth segments, which are more united in a cup at the base, the stouter pedicels and peduncles, and the broader leaves. 1885.

N. Manselli (Mansell's). *fl.* bright rose-red, ten to twenty in an umbel. *l.* bright green, 1½in. broad. 1886. A fine hybrid between *N. flexuosa* and *N. curvifolia.*

N. Moorei (Moore's). *fl.* six to nine; perianth bright scarlet, erect, the segments cut down to the ovary, oblanceolate, crisped, 1½in. long, nearly ½in. broad; pedicels ⅔in. to 1in. long; peduncle about 8in. long. *l.* 9in. to 12in. long, ½in. to ⅔in. broad, curved, slightly twisted, blunt, thick and leathery, shining. 1886.

NESOPANAX. Included under **Plerandra** (which *see*).

NEVIUSA (named in honour of the Rev. R. D. Nevius, of Alabama, the discoverer of the plant). ORD. *Rosaceæ.* A monotypic genus. The species is a nearly or quite hardy, glabrous, slender shrub, with cylindric branches and very slender, puberulous, leafy branchlets. It thrives in ordinary garden soil, in sheltered positions, and may be propagated by cuttings.

N. alabamensis (Alabama). *fl.* 1in. in diameter across the spreading stamens, in terminal, sessile, sub-paniculate corymbs; calyx tube green, small, the five lobes ½in. long, deeply toothed; stamens white, numerous, in many series; anthers yellow. May. *l.* alternate, petiolate, 1½in. to 3½in. long, membranous, pale green, ovate or oblong-ovate, acute or acuminate, usually doubly serrulate, puberulous; petioles ½in. to ¾in. long. Alabama, 1882. (B. M. 6805.)

NOTYLIA. To the species described on p. 457, Vol. II., the following should now be added:

N. Bungerothii (Bungeroth's). *fl.* yellowish-green, closely packed; dorsal sepal very falcate; petals linear-falcate, white, and having an orange spot at base; lip white, small, singularly rounded; peduncle long, many-flowered. *l.* nearly 9in. long, 2in. to 3in. broad. Pseudo-bulbs very large and broad, oblong. Central America, 1887.

NYMPHÆA. To the species and varieties described on pp. 459-60, Vol. II., the following should now be added:

N. alba candidissima (whitest). A large-flowered form of *N. alba.*

N. Daubenyana (Daubeny's). *fl.* pale blue, large, with a cluster of yellow stamens, each of which is tipped with a blue point, nicely scented, remaining open all day and closing in the evening. *l.* very handsome, with entire margins, producing in the angle of the opening small plants, which grow readily. 1882. Stove.

N. Kewensis (Kew). A garden hybrid between *N. Devoniensis* and *N. Lotus*, differing from the former principally in the colour of its flowers, which are rosy-red, with the lower part of the petals almost white, and which are sometimes as much as 9in. in diameter. (B. M. 6988.)

N. Marliacea chromatella (Marliac's yellow). A synonym of *N. tuberosa flavescens.*

N. odele. A synonym of *N. stellata purpurea.*

N. stellata purpurea (purple). A handsome variety, with reddish-purple flowers. 1887. SYN. *N. odele.* (R. G. 1240, under name of *N. zanzibarensis flore-rubro.*)

Nymphæa—*continued.*

N. tuberosa flavescens (yellowish). *fl.* creamy-white, 4in. to 6in. in diameter; stamens bright yellow. *l.* as in *N. alba*. Rhizome long and stout, producing numerous tubers. 1887. SYN. *N. Marliacea chromatella.*

Octomeria—*continued.*

acuminate; lip one-fourth as long as the sepals and petals, obtuse, yellowish, with a large, lurid-purple blotch; peduncles bearing two or three flowers. *l.* elliptic, fleshy, whitish-green above, beneath dark green, obscurely tessellated with dark

FIG. 44. NEPHTHYTIS PICTURATA, showing Habit and detached Leaf (see p. 573).

OCTOMERIA. To the species described on p. 467, Vol. II., the following should now be added:

O. supraglauca (glaucous above). *fl.* ⅜in. long; sepals and petals pale glassy-green, faintly tinted purplish outside, lanceolate, purple, and minutely furrowed. *h.* about 2in. 1887. Plant tufted.

ODONTOGLOSSUM. To the species described on pp. 470-5, Vol. II., the following should now be added.

Odontoglossum—*continued.*

Those known to require warm-house treatment are indicated by a dagger (†).

O. Andersonianum lobatum (lobed). A synonym of *O. crispum lobatum.*

O. A. splendens (spendid). A synonym of *O. crispum splendens.*

O. A. tenue (slender). A synonym of *O. crispum tenue.*

O. angustatum (narrowed). *fl.* in erect, shortly branched panicles; sepals greenish, with a brown mid-line, linear, very acuminate; petals yellow, transversely barred cinnamon-brown, broader than the sepals, crisped; lip white, the anterior part oblong-triangular, wavy, toothed, with brown streaks and bars, and a crest of two serrated lamellæ, one middle keel, and a tooth on each side of it. Pseudo-bulbs pyriform, ancipitous, each with one broadly lanceolate leaf from its apex, and about four accessory ones at its base. Peru. (B. O. 26.)

O. astranthum (star-flowered). *fl.* nearly 2in. across, the organs stellately disposed; sepals and petals yellowish, streaked and blotched purplish-brown; lip white, spotted pale rose, ligulate, acuminate in front, the base of the column orange, with a few reddish-purple spots; panicle branching, upwards of fifty-flowered. Ecuadorean Andes. Something like *O. odoratum.*

O. baphicanthum (dyed-flowered). A variety of *O. odoratum.*

O. bictonense roseum (rosy). *fl.*, sepals and petals brown; lip deep rose. *O. b. rubrum* is probably synonymous with this.

O. b. rubrum (red). *See* **O. b. roseum.**

O. b. speciosum (showy). *fl.*, sepals and petals dark purple, transversely marked yellow; lip rosy-purple. 1887. (R. G. 1250, f. c-d.)

O. b. sulphureum (sulphur). *fl.*, sepals and petals yellow; lip white.

O. blandum Rossianum (Ross'). *fl.*, sepals and petals spotted brown; lip yellow, with red spots at base, the blade spotted and streaked purple, the crests yellow. 1886.

O. Boddaërtianum (Dr. Boddaërt van Cutsem's). *fl.*, sepals and petals yellow, marked dark cinnamon, lanceolate, acuminate; lip white, the basilar lobes semi-ovate, erect, dotted mauve-purple, the median lobe with small, spreading basilar angles; column whitish-yellow, spotted brownish-purple. Venezuela.

O. Bowmanni (Bowmann's). A form of *O. crispum.*

O. brachypterum (short-winged). *fl.*, sepals and petals light yellow, with a few cinnamon blotches; lamina of the lip yellow, with a large cinnamon blotch in front of the crest, which consists of five parallel keels, the stalk channelled, adpressed on the column, which is streaked and blotched cinnamon. Ocaña. New Grenada, 1882. A natural hybrid.

O. Brassia (Brassia-like). A synonym of *O. odoratum deltoglossum.*

O. cærulescens (bluish). A synonym of *O. Rossii.*

FIG. 45. ODONTOGLOSSUM CERVANTESII, showing Habit and detached Flower.

Odontoglossum—*continued.*

O. Cervantesii Andersoni (Anderson's). *fl.* white, with broken bars of reddish-brown at the base of the sepals and petals; lip bordered with reddish-brown spots. Mexico. The type is shown in Fig. 45.

O. C. roseum (rosy). *fl.* pale rose-coloured.

O. chætostroma (bristled-lip). *fl.*, sepals blackish-purple, tipped yellow, lanceolate, acuminate; petals yellow, spotted blackish-purple; lip yellow, marked cinnamon, pandurate, narrow at base, suddenly dilated and acuminate in the anterior part, which is fringed; column wings very narrow. *l.* and pseudo-bulbs reddish-brown. 1883. Said to be a natural hybrid between *O. Hallii* and *O. cristatum.*

O. chiriquense (Chiriqui). A variety of *O. coronarium.*

O. cinnamomeum (cinnamon). *fl.* strongly scented, resembling those of *O. odoratum*, but with broader and more densely marked sepals and petals; lip yellow, downy, with a large, brownish-crimson spot on the disk, the margin faintly spotted with crimson. 1885.

O. constrictum castaneum (chestnut-brown). *fl.*, sepals and petals brown, having one or two greenish-white lines at the base. 1885.

O. c. pallens (pale). *fl.*, sepals and petals sulphur; lip whitish, with a very light yellowish hue.

O. cordatum Kienastianum (Kienast's). A variety remarkable for the few broad blotches on the sepals and petals; the lip is very dark brown in front. 1886.

O. c. superbum (superb). *fl.* more richly coloured, and larger than in the type; scape upwards of 2ft. high, much branched. Mexico.

O. coronarium chiriquense (Chiriqui). *fl.* paler and larger than in the type; sepals chestnut-brown; petals yellow, with some brown markings; lip yellow, with a brown blotch on the disk. Chiriqui. SYN. *O. chiriquense.*

O. c. miniatum (scarlet). *fl.* smaller than in the type; sepals and petals chestnut-brown, bordered yellow; lip yellow; inflorescence denser. Pseudo-bulbs more closely placed. Ecuador. SYN. *O. miniatum* (of gardens).

O. crinitum sapphiratum (sapphire). A fine variety, having the white lip covered with light mauve-bluish spots. 1886.

O. crispum Andersonianum. According to Messrs. Veitch, the following are merely colour forms of this variety: *angustatum, Josephineæ, lobatum, Pollettianum,* and *tenue;* but for convenience of reference they are kept distinct in this work.

O. c. angustatum (narrowed). *fl.*, sepals and petals narrower and more pointed than in *O. c. Andersonianum*, the petals having larger blotches.

O. c. apiatum (bee-like). *fl.*, all the segments marked with one large brown blotch and two smaller ones, the sepals stained violet-purple. 1886.

O. c. aureum magnificum (golden, magnificent). *fl.* creamy-yellow, 3in. across; sepals and petals blotched chocolate-red; spikes stout, erect, branched at base. 1883.

O. c. Ballantynei (Ballantyne's). *fl.*, sepals and petals having a large, sanguineous-purple blotch in the centre; lip with large, reddish-brown spots around the crest.

O. c. Bowmanni (Bowmann's). *fl.*, sepals white, flushed and blotched deep rose; petals white, spotted rose towards the base; lip broadly hastate, with four or five reddish-brown spots and a large yellow disk. New Grenada. SYN. *O. Bowmanni.*

O. c. Cutsemianum (Cutsem's). *fl.* white, spotted red, large, with broad, toothed petals.

O. c. Dayanum (Day's). *fl.*, sepals with an irregular, central, mauve-purple blotch; petals with one or two circular spots and a streak at the base; lip white.

O. c. Edithiæ (Edith's). *fl.* yellow, blotched brown; sepals suffused rose; petals white in the centre. Columbia. SYN. *O. Edithiæ.*

O. c. Hrubyanum (Hruby's). *fl.* large, the whole of the central area of the very broad sepals and petals occupied by a brown blotch. Columbia.

O. c. hyperxanthum (extra-yellow). *fl.*, sepals with a few light yellow spots; petals white, rhomboid, serrated; lip and column yellow. 1887.

O. c. Josephineæ (Josephine's). *fl.*, sepals and petals blush-white, spotted reddish-chocolate; lip recurved at tip, having a yellow disk. Winter. SYN. *O. Josephineæ* (W. O. A. iv. 188).

O. c. lobatum (lobed). *fl.* numerous, 2½in. across; sepals and petals creamy-white, spotted chestnut-brown at base; lip spotted chestnut, and with two lines of the same colour. New Grenada. SYN. *O. Andersonianum lobatum.*

O. c. Pollettianum (Pollett's). *fl.*, sepals and petals tinted purple, margined creamy-white, spotted reddish-brown; lip with a brown blotch in the middle. New Grenada. (M. O. i. 26.) SYN. *O. Pollettianum.*

Odontoglossum—*continued.*

O. c. Reginæ (queenly). *fl.* white, evenly spotted reddish-brown, the disk of the lip yellow. New Grenada. (W. O. A. vi. 264.)

O. c. Ruckerianum. (M. O. i. 27.) According to Messrs. Veitch, the following are mere colour forms of this variety: *apiatum, Ballantynei, Cooksoni, Dayanum, fastuosum, flaveolum, guttatum, Hrubyanum, Reginæ, Schrœderi,* and *Wilsoni.*

O. c. Schrœderi (Baron von Schrœder's). *fl.*, all the segments with one deep, large, reddish-brown blotch (or sometimes two) and two or three smaller ones; in addition to these, several reddish-brown spots are scattered over the remaining white area.

O. c. Scottii (Scott's). *fl.* creamy-yellow, large and showy; sepals entire, with large, bold spots of chestnut-brown; petals coarsely toothed, with fewer and smaller spots near the base; lip having prominent, yellow crests. *l.* ligulate. Pseudo-bulbs flat, ovate. 1883.

O. c. splendens (splendid). *fl.* white, tinged rose; sepals with a brown blotch in the centre and several smaller ones at base; petals spotted brown at base; lip with a large, central, brown blotch and some small brown spots on each side of the base, which is yellow, with some radiating, dark red lines. SYN. *O. Andersonianum splendens.*

O. c. tenue (slender). *fl.* smaller than in *O. c. Andersonianum*, milk-white, with a brown blotch on each sepal. SYN. *O. Andersonianum tenue.*

O. c. virginale (virgin-white). *fl.* pure white, the lip marked with one or two small dots and having yellow on the disk. 1882. A handsome variety.

O. c. Wilsoni (Wilson's). *fl.* very delicate blush, very large; petals broad, fringed; sepals and lip having a few chocolate spots. 1882.

O. c. Wolstenholmiæ (Mrs. Wolstenholme's). *fl.*, sepals and petals pure white, spotted ochre-brown in the centre, bordered mauve, very acuminate, the petals lobed and toothed; lip having a brown, ligulate disk and yellow calli; column yellow at base. 1887.

O. cristatellum (slightly crested). A variety of *O. cristatum.*

O. cuspidatum (cuspidate). A variety of *O. luteo-purpureum.*

O. Dawsonianum (Dawson's). A garden synonym of *O. Rossii Ehrenbergii.*

O. deltoglossum (deltoid-lipped). A variety of *O. odoratum.*

O. Denisoniæ (Lady Londesborough's). *fl.* over 4in. across; sepals white, with a few pale purplish spots, lanceolate, acuminate; petals pure white, rather broader, acuminate; lip oblong, blunt, denticulate, with a pale yellow stain over the disk and a few purple spots; all the parts undulated at the edges; racemes elongated. *l.* two, oblong-lanceolate. Pseudo-bulbs ovate. New Grenada. Supposed to be a natural hybrid between *O. crispum* and *O. luteo-purpureum.*

O. dicranophorum (two-pronged). *fl.* as large as those of *O. triumphans*; sepals light yellow, linear-ligulate, acute, marked with two large, brown areas; petals broader at base, acuminate, with a brown blotch in the middle and several brown spots at base; lip very light yellow, unguiculate, a depressed callosity projecting from the centre, and extending into two rather thick lamellæ, which, with the superior callus, give the appearance of a two-pronged fork, whence the name; column yellow at base, white at top; raceme loose. Possibly a hybrid.

O. Edithiæ (Edith's). A variety of *O. crispum.*

O. Ehrenbergii (Ehrenberg's). A variety of *O. Rossii.*

O. elegans chrysomelanum (deep-golden). A variety in which there is no white disk on the upper sepal nor on the petals, while the lip and column are also yellow. 1888.

O. euastrum (beautiful star). *fl.*, sepals white, marked mauve and spotted cinnamon; lip heart-shaped over its stalk, nearly semicircular, an abrupt, long-lanceolate lacinia projecting from its centre, and sepia-brown, denticulate, indurate, sessile lamellæ standing at the base, the disk spotted brown, the base of the anterior lacinia white. 1887. Hybrid.

O. eugenes (illustrious). *fl.*, sepals pale yellow, with brown blotches, usually arranged in three groups; petals with a broad, pale yellow margin, the base and centre white, with some brown spots; lip as in *O. triumphans*, with a crest similar to that of *O. Pescatorei. l.* as in *O. Pescatorei.* Columbia. A handsome plant, supposed to be a hybrid between the species named.

O. excellens (excellent). *fl.*, sepals yellow, blotched purple, the dorsal one with a white centre; petals white, margined yellow, broader; lip white, blotched purple, pandurate, emarginate, apiculate, the crests yellow. Summer. Supposed to be a natural hybrid between *O. Pescatorei* and *O. tripudians* (or *O. triumphans*). (Gn. xxi. 330; I. H. 1886, 591.)

O. facetum (elegant). A variety of *O. luteo-purpureum.*

O. ferrugineum (rusty). *fl.*, sepals and petals dark cinnamon, tipped yellow, rather broad, the lateral sepals standing under the lip, the petals toothed; lip whitish-yellow, with a brown spot on the disk, sub-cordate over the stalk, narrow-oblong for

Odontoglossum—*continued.*

half the length of the blade, then suddenly dilated into a nearly reniform, apiculate, toothed, fringed body; column wings small, with teeth. 1883. Probably a natural hybrid.

O. gracile (slender). *fl.* reddish-brown, about 1in. in diameter; lip fleshy, with two whitish crests; peduncle blackish, paniculately branched, the branches two or three-flowered. *l.* and pseudo-bulbs tinged blackish. Ecuador. A distinct-looking species.

O. grande magnificum (magnificent). *fl.* 7in. in diameter, brilliantly marked; scape about sixteen-flowered. Guatemala.

O. Harryanum (Harry Veitch's).† *fl.*, sepals and petals brown, with transverse, greenish-yellow lines, the petals projecting straight forward; lip very large, divided across the middle into two pieces, the one pure white, the other brownish-lake, with bright yellow, fringe-like crests. *l.* leathery, oblong, obtuse, 7in. to 10in. long. Pseudo-bulbs oval-oblong, compressed, 2½in. to 3in. long, two-leaved. Habitat unknown. 1887. (G. C. ser. iii., vol. ii., p. 169; M. O. i. 37.)

O. hebraicum (Hebrew-marked). A variety of *O. odoratum.*

O. Hinnus (mule). A variety of *O. luteo-purpureum.*

O. Hrubyanum (Hruby's). A garden synonym of *O. cirrosum.*

O. Humeanum (Hume's). A variety of *O. Rossii.*

O. ioplocon (violet-woven). This is closely allied to *O. Edwardi*, but it differs as follows: sepals longer, narrower, and more undulated; lip much smaller; and in the forms of the calli and column wings—"differences that seem to indicate a hybrid origin" (Veitch).

O. Jenningsianum (Jennings'). A variety of *O. crispum.*

O. Josephineæ (Josephine's). A variety of *O. crispum.*

O. læve auratum (golden). *fl.*, lip very narrow, a little dilated at the apex and acute at the top. 1885.

O. Leeanum (Lee's). A variety of *O. odoratum.*

O. ligulare (strap-like). A variety of *O. Lindleyanum.*

O. liliiflorum (Lily-flowered), of gardens. A variety of *O. ramosissimum.*

O. limbatum (bordered). A variety of *O. crispum.*

O. Lindleyanum albidulum (whitish). *fl.* yellowish-white, with some light sulphur at the base of the lip. 1885.

O. L. Coradinei grandiflorum (large-flowered). *fl.* light yellow, blotched and spotted chestnut-brown, large and handsome. New Grenada, 1887.

O. L. Kindlesidianum (Kindlesid's). *fl.*, sepals and petals white, bordered with yellow. 1885.

O. L. mirandum breve (short). *fl.* unusually short; sepals and petals conspicuously blotched purplish-brown; disk of the front part of the lip flushed sepia. 1885.

O. Lucianianum (Lucien Linden's). *fl.* white, blotched with reddish-purple, racemose; sepals and petals lanceolate, acuminate; lip velvety, the epichil oblong-ligulate, cuspidate, with crenulate margins; wings of the column linear-aristate, very narrow. Pseudo-bulbs pyriform, attenuated, smooth. Venezuela, 1887. (I. H. ser. v. 7.)

O. luteo-purpureum Hinnus (mule). *fl.*, sepals and petals narrower than in the commoner forms, and undulated; lip subrhomboidal, with many-toothed calli. SYN. *O. Hinnus.*

O. l.-p. magnificum (magnificent). *fl.* large; sepals chestnut-brown except at base and apex; petals and lip heavily blotched chestnut-brown. New Grenada, 1887. (W. O. A. vi. 254.)

O. l.-p. Vuylstekeanum (Vuylsteke's). *fl.* sulphur, with a few blotches of the deepest and richest orange on the odd sepal, the petals, and the lip (which is much dilated at the top); lateral sepals orange, except at their base. New Grenada. A grand variety. The form *maculatum* has the disk of petals and base of lip whitish-sulphur, the other parts deep yellow, a few conspicuous, cinnamon blotches being scattered over sepals, petals, and lip. 1884.

O. macrospilum (large-blotched). *fl.*, sepals and petals light sulphur, or white and light mauve, with deep blotches of dark cinnamon, cuneate-lanceolate, acute; lip broadly triangular-cordate, apiculate or acute, with numerous lateral keels and a central one; wings of the column denticulate, entire or lacerate. 1885. Probably a natural hybrid.

O. maculatum integrale (entire). *fl.*, sepals light brown; petals white, transversely barred brown at base; lip white, with a yellow crest. Guatemala. The type is shown at Fig. 46.

O. Marriottianum (Marriott's).† *fl.* large; segments white, spotted pale purple, narrow, reflexed at the tips; crest of the lip yellow, streaked pale purple. *l.* (and pseudo-bulbs) approaching those of *O. Halli.*

O. miniatum (scarlet), of gardens. A variety of *O. coronarium.*

O. mirandum (extraordinary). A variety of *O. Lindleyanum.*

Odontoglossum—*continued.*

O. Mulus (mule). A variety of *O. luteo-purpureum.*

O. odoratum hemileucum (half-white). *fl.* having the disk of the petals and nearly the whole of the lip white. 1883. A beautiful variety.

O. Pescatorei Germinyanum (Comte de Germiny's). *fl.* white, flushed rosy-purple on the sepals, and marked with a few rose-purple spots, chiefly on the mid-line of the sepals, and one at the apex of the petals; basal part of the lip broadly margined purple round a yellow disk, which has some radiating, purple lines and a figured blotch in front, the front lobe spotted purple. (W. O. A. vii. 305.)

FIG. 46. ODONTOGLOSSUM MACULATUM.

O. P. leucoxanthum (white-and-yellow). *fl.* of a pure white, except some orange on the crests of the lip, the wings, and the base of the column. 1887. A remarkable form. (G. C. ser. iii., vol. i., p. 606.)

O. P. melanocentrum (dark-spurred). *fl.* white, having the column and the base of the lip blackish-purple. 1885.

O. P. stupendum (stupendous). *fl.*, dorsal sepal with a bright mauve-purple disk, the lateral ones of the same colour on the outer halves, the inner halves white; petals white, with a few mauve spots; borders of the side laciniæ of the lip marked mauve; column white, orange, and mauve. 1887.

O. Pollettianum (Pollett's). A variety of *O. crispum.*

O. polyxanthum grandiflorum (large-flowered). *fl.* large; sepals and petals deep yellow, the former marked with a few large, brown blotches, the latter with smaller blotches confined to the base; lip chocolate-brown, edged whitish, yellow at base. Ecuador, 1887. (W. O. A. vi. 258.)

O. prionopetalum (serrate-petaled). *fl.*, sepals and petals rich yellow, heavily spotted and barred chestnut-brown, the petals deeply serrate; lip white in front, pale yellow behind, with a large, transverse, brown blotch in the centre. Spring. New Grenada. A handsome plant, allied to *O. luteo-purpureum.*

O. pulchellum Dormannianum (Dorman's). *fl.* white, 1½in. to 1¾in. in diameter; sepals and petals ⅛in. broad. Pseudo-bulbs stronger, stouter, and rounder than in the type. Guatemala.

O. ramosissimum liliiflorum (Lily-flowered). *fl.* pale rose-purple, larger than in the type, the sepals and petals less wavy, the basal part marked with some white, ocellated spots. New Grenada. SYN. *O. liliiflorum* (of gardens).

O. retusum (retuse). *fl.*, sepals and petals orange-red, tinged yellow, lanceolate, acute; lip yellow, or the same colour as the sepals and petals, oblong, retuse, bilamellate at base; panicle branched, 100 to 150-flowered. *l.* linear-lanceolate, papery. Ecuador, 1846. A dwarf, small-flowered species.

O. rhynchanthum (beak-flowered). *fl.*, sepals and petals yellow, ligulate, acute, with a brown line and a few brown spots at the base of the petals; lip with a narrow, acuminate front lobe, two or four keels, and no bristles; raceme lax. 1887. This plant is something in the way of *O. Lindleyanum.*

Odontoglossum—*continued.*

O. rigidum (rigid). *fl.* bright canary-yellow, on long footstalks; sepals and petals oblong, acute; lip deeper in colour than the other segments, with a long claw and sub-quadrate blade that has an apiculus in the centre of the anterior margin; crest bidentate; column three-angled, green at base, yellow at apex; inflorescence tall, paniculate. *l.* linear. Pseudo-bulbs ovate.

O. roseum (rosy). A synonym of *Cochlioda rosea.*

O. Rossii majus (larger). A synonym of *O. R. rubescens.*

O. R. Smeeanum (Smee's). *fl.* large; sepals chestnut-brown, dotted white; petals white, with a lobed, chestnut disk and mid-base; lip white, with a yellow callus. 1887.

O. R. virescens (greenish). *fl.* white, spotted green.

O. rubescens (reddish). A variety of *O. Rossii.*

O. Ruckerianum (Rucker's). A variety of *O. crispum.*

O. Sanderianum (Sander's). A variety of *O. constrictum.*

O. Schrœderianum. This is now regarded as a form of *O. crispum;* but the plant described in G. C. ser. iii., vol. ii., p. 364, under this name, is *Miltonia Clowesii.*

O. spectatissimum most splendid). A synonym of *O. triumphans.*

O. Staurastrum (cross-star). *fl.*, sepals and petals light yellowish-green, with square, sepia-brown blotches; side lobes of lip obtuse-angled, the middle one ligulate, acute, white, sepia-brown, and mauve. *l.* broader than in *O. Lindleyanum.* 1887. Supposed to be a hybrid between *O. Lindleyanum* and *O. tripudians.*

O. S. Gravesianum (Graves'). *fl.*, sepals and petals ochreous-sulphur, lined and spotted purplish-brown at base; lip white, the centre and some lines and spots at the base purplish-brown, the crests yellow. 1887.

O. stellimicans (glittering star). *fl.*, sepals and petals clear yellow, lanceolate, stellate, the petals with a brown line at the base, the sepals washed reddish-mauve outside and blotched brownish-purple within; lip having a well-developed stalk, pandurate, with triangular base and lobes, and a reniform front lobe, some small spots at the base, and a broad-lobed blotch on the stalk. 1884. Natural hybrid.

O. tripudians leucoglossum (white-lipped). *fl.*, ground-colour of the lip white.

O. viminale (twiggy). *fl.*, sepals and petals brown, with whitish-sulphur borders, and linear spots around the margin, which are scarcely visible; lip light sulphur at base, deep yellow in front, with an angle at each side of the base and the lanceolate anterior part; column pale green, bordered mauve at top. *l.* linear, acute, more than 1ft. long. Pseudo-bulbs the size of a large hen's-egg. Columbia, 1885.

O. Vuylstekeanum (Vuylsteke's). A variety of *O. luteo-purpureum.*

O. Warneri purpuratum (Warner's purple). A synonym of *Oncidium Warneri.*

O. Warnerianum (Warner's). A variety of *O. Rossii.*

O. Warscewiczii (Warscewicz'). A synonym of *Miltonia Endresii.*

O. Wilckeanum albens (whitish). *fl.* white, blotched and spotted reddish-brown, 2½in. to 3in. across; sepals lanceolate, acute; petals broadly ovate, very acute, toothed on the margins; lip pandurate, having a yellow area at the base, the margins crisped. 1886. A handsome garden hybrid.

O. W. pallens (pale). *fl.* whitish, blotched with brown. Columbia, 1885. A showy variety.

O. Williamsianum (Williams'). A variety of *O. grande.*

OLEARIA. To the species described on pp. 481-2, Vol. II., the following should now be added:

O. dentata (toothed), of Hooker. A synonym of *O. macrodonta.*

O. macrodonta (large-toothed). *fl.* white, small, Daisy-like, disposed in large, hemispherical corymbs. *l.* elliptic-oblong, undulated, coarsely toothed, somewhat Holly-like in appearance. New Zealand, 1886. Hardy shrub or tree. (G. C. n. s., xxvi., pp. 304-5.) SYN. *O. dentata* (of Hooker).

O. nitida (shining). *fl.-heads* white, in close, many-flowered, rounded corymbs; florets fifteen to twenty. *l.* resembling those

Olearia—*continued.*

of *O. furfuracea*, but more ovate, less coriaceous, sinuate-toothed, acute or acuminate, the tomentum more silvery and shining. New Zealand, 1886. A small, hardy tree. (G. C. n. s., xxvi., pp. 44-5.)

O. Traversii (Travers'). *fl.-heads* ¼in. long, very numerous, on slender pedicels; panicles numerous, cymose, axillary and terminal, much-branched. *l.* flat, opposite, oblong- or ovate-lanceolate, acuminate, quite entire, 1½in. to 2½in. long, glabrous and shining above, silky-downy beneath (as well as the panicles and branches). *h.* 30ft. to 35ft. New Zealand, 1887. (G. C. ser. iii., vol. ii., p. 187.)

OMPHALODES. To the species described on pp. 482-3, Vol. II., the following should now be added:

O. Krameri (Kramer's). *fl.* of a rich blue, about as large as a sixpence. *l.* ample. Japan, 1882. A beautiful addition to our hardy plants; it is larger in growth than either *O. Luciliæ* or *O. verna.*

O. verna alba (white). This only differs from the type in having white flowers.

Oncidium—*continued.*

O. caloglossum (beautiful-lipped). *fl.*, sepals and petals yellow, striped sepia-brown, the stripes confluent in the petals; lip of brighter yellow, blotched brown in front, the warts of the calli reddish, with numerous brownish-red spots all around; column light yellow, spotted brownish-red at base, the wings spotted purple. Tropical America, 1885. [T.]

O. chrysops (golden-eyed). *fl.*, sepals light brown, cuneate-oblong; petals light brown, much broader, somewhat wavy, blunt; lip bright yellow, the basilar laciniæ small, the isthmus very short, the large anterior blade reniform, emarginate, the calli triseriate; peduncle reddish, racemose. *l.* reddish, short. 1888.

O. chrysorhapis (golden-needled). *fl.*, sepals and petals light sulphur-yellow, the disk spotted dark brown, forming one mass, with extended external processes on the upper sepal and petals; side laciniæ of the lip linear, lobed at top, erect, the claws covered with tumours, the anterior blade reniform, emarginate, very large; pedicels three to five-flowered. *l.* cuneate-oblong-lanceolate, acute, 6in. to 7in. long, 1½in. wide. Brazil, 1888. [T.]

O. crocodiliceps (crocodile's-head). *fl.* several in a one-sided

FIG. 47. ONCIDIUM INCURVUM, showing Habit and detached Flowers.

ONCIDIUM. To the species and varieties described on pp. 483-91, Vol. II., the following should now be added. Those marked T. are tropical, while those marked C. will thrive in a cool-house. The remainder require an intermediate temperature.

O. anthocrene (flower-fountain). *fl.* disposed in large, upright, branched spikes; sepals and petals chocolate-brown, transversely barred yellow towards the base, much undulated; lip white. Summer. Peru. A curious species, in habit somewhat resembling *Miltonia Warscewiczii.* [T.]

O. aurosum (golden). A variety of *O. excavatum.*

O. bicolor (two-coloured). A variety of *O. Martianum.*

O. Brauni (Braun's). *fl.* fuscous-orange and greenish-yellow; sepals oblong, reflexed, the lateral ones connate at base; petals ovate-oblong; lip three-lobed, slightly exceeding the sepals and petals, the middle lobe dilated and bilobed; panicle flexuous, elongated, loosely arcuate-recurved, the lower branches two or three-flowered, the upper ones one-flowered. *l.* terminal, solitary, ovate-oblong, half the length of the panicle. 1886. (R. G. 1235, a-c.) [C.]

raceme; sepals and petals greenish-sulphur, striped and blotched cinnamon, the sepals ligulate, acute, the petals sub-equal lip white, with a tuft of yellow hairs at the sub-cordate or rounded base, and a velvet callus in front; anther very large, comparable to a broad crocodile's head. *l.* cuneate-oblong, acute, very strong. Pseudo-bulbs ultimately much wrinkled. Mexico, 1885. [C.]

O. cruentum (bloody). A synonym of *O. reflexum pelicanum.*

O. excavatum Dawsoni (Dawson's). *fl.* bright yellow and rich brown, large; scape 5ft. long, sometimes producing a hundred flowers. Peru.

O. hastatum hemimelænum (half-black). *fl.*, sepals and petals blackish-purple, tipped whitish-green; mid-lacinia of the lip brownish. 1887.

O. Henchmanni (Henchmann's). A synonym of *O. carthaginense sanguineum.*

O. hians (gaping). *fl.* yellow and brown, small; lip having an extraordinary, erect, white, fleshy appendage, as long as the column, parallel with that organ, and resembling the four fingers of a hand a little hollowed out and closed together; column without cheeks; stigma beaked. Brazil. (R. G. 1250.) [T.]

Oncidium—*continued.*

O. holochrysum (wholly yellow). *fl.* rich golden-yellow, very densely disposed in secund racemes; lip trifid, the large middle lobe clawed, reniform, bilobed. *l.* two, rather thick, ligulate, acute. Pseudo-bulbs oblong, sulcate, spotted. Peru. [C.]

O. Hookeri (Hooker's). *fl.* lively yellow, small; sepals and petals oblong, nearly equal, the latter spotted orange; lip three-lobed, the lateral lobes linear-oblong, spreading, the middle one broadly obovate-cuneate, the base orange or chestnut-coloured and tubercled; scape 6in. to 18in. long, paniculately branched. *l.* 5in. to 8in. long, linear-ligulate. Pseudo-bulbs clustered, two-leaved. Brazil. (B. M. 3712, under name of *O. raniferum major.*) [C.]

O. Hubschi (Hubsch's). *fl.* yellow, tinted brown, disposed in a much-branched panicle; lip narrower in front than at base, its chief mark consisting in the bipartite, orange column wings. Ecuador, 1885.

O. incurvum. This pretty and easily-grown species is described on p. 487, Vol. II. Fig. 47 shows the habit and the character of its inflorescence.

O. ionosmum (Violet-scented). A synonym of *O. tigrinum unguiculatum.*

Oncidium—*continued.*

O. ludens (playful). *fl.*, sepals rich brown, unguiculate, the upper one transversely elliptic, the lateral ones oblong, acute; petals yellow, marbled cinnamon, shortly unguiculate, hastate, annular, occurring both closed and open; lip pale yellowish-ochre and brown, recurved towards the apex; column greenish, striped brown, the wings dark purple. 1885. Allied to *O. annulare.* [T.]

O. macranthum Williamsianum (Williams'). *fl.* having a large, Indian purple blotch on each petal. New Grenada.

O. micropogon (small-bearded). *fl.* 1½in. across the petals; sepals yellow, banded pale brown, linear-oblong, acuminate, undulated; petals golden-yellow, with a deep reddish-brown claw, much broader than the sepals; lip golden-yellow, with three sub-equal, spreading, clawed lobes, the disk covered with yellow and brown tubercles; raceme 8in. to 10in. long, pendulous. August. *l.* two to a pseudo-bulb, 4in. to 6in. long, linear-oblong. South Brazil (?), 1886. (B. M. 6971.)

O. monachicum (monkish). *fl.*, dorsal sepal dark brown, with a crisped, yellow border, reniform, overarching, the lateral ones large, cuneate-oblong, on long stalks; petals cinnamon, blotched and edged sulphur-yellow, roundish-hastate, incurved, undulated; lip brown, ligulate, with an angular base and a double

FIG. 48. ONCIDIUM JONESIANUM, showing (1) Habit, (2) Front and (3) Side Views of detached Flowers, and (4) Pseudo-bulb.

O. Jonesianum phæanthum (dusky-flowered). *fl.* having brownish sepals and petals, a smaller crest on the lip, and no spots. 1887. The type is shown in Fig. 48. [T.]

O. Keilianum (Keil's). A synonym of *Brassia Keiliana.*

O. Kramerianum (Kramer's). A variety of *O. Papilio.*

O. leopardinum (leopard-marked). *fl.* yellow, showy, disposed in loose panicles about 3ft. high; sepals and petals banded dark brown; lip banded brown at base, the middle lobe unguiculate, transversely emarginate, the base auriculate. Peru. A free-flowering, compact species. [T.]

O. lepturum (slender-tailed). *fl.*, properly formed ones light yellow, spotted brown; sepals and petals cuneate-oblong, acute; lip with a very broad, cordate base, narrowed into a small, bifid apex, and having a cushion of finger-like calli at the base. 1886. One of the group with tufts of abortive flowers. [C.]

O. loxense (Loxa). *fl.* in a broad panicle; sepals dull olive, barred cinnamon, unguiculate, oblong, acute; petals broader and shorter; lip bright orange, having a tooth-like auricle on each side of the base, a short, broad stalk, and a broad, reniform blade. *l.* cuneate-ligulate, acuminate. Pseudo-bulbs oblong, furrowed, two-leaved. Cordillera of Loxa, 1884. [C.]

callus; spikes large and branching, as in *O. serratum.* March and April. New Grenada. Allied to *O. metallicum.* (G. C. n. s. xix., p. 368.) [T.]

O. nubigenum (cloud-born). A variety of *O. cucullatum.*

O. Papilio Kramerianum resplendens (resplendent). In this form the flowers are much larger, and the colours brighter, than in *Kramerianum;* the callus of the lip, also, is longer than in that variety, and has the base and apex yellow, spotted and barred purplish-brown, the middle being white, barred purplish-mauve; the lip itself lacks the brown margin generally seen. [T.]

O. P. majus (greater). *fl.* dark brown, barred yellow; lip very large, bright yellow in the centre, edged dark brown. Trinidad. [T.]

O. pardoglossum (panther-marked-lipped). *fl.* chestnut-coloured, narrow, much marked with yellow on the lip, and having a very obscure, yellow band on the dorsal sepal; column light yellow, very long, with brownish-purple wings. 1886. An interesting species.

O. Pollettianum (Pollett's). *fl.* large; sepals yellow, the dorsal one oblong, acute, the lateral ones connate and two-toothed at apex; petals brown, bordered yellow; lip having small, roundish

Oncidium—*continued.*

auricles at base, a long, narrow neck, and a broad, four-lobed blade, the outer lobes broadest; raceme many-flowered. 1886. A showy species. [T.]

O. raniferum major (frog-bearing, larger). A synonym of *O. Hookeri.*

O. Rigbyanum (Rigby's). A synonym of *O. sarcodes.*

O. Rogersii (Rogers'). A variety of *O. varicosum.*

O. roseum (rosy). A synonym of *O. carthaginense sanguineum.*

O. sanguineum (bloody). A variety of *O. carthaginense.*

O. sarcodes discoidale (discoid). A trifling variety, having no spots on the front part of the lip. 1886.

O. Sprucei (Spruce's). *fl.* bright yellow, produced in great profusion; sepals and petals blotched red above, obovate, obtuse; lip having the transverse middle lobe narrowly clawed, two-lobed, stained red at base; panicles flexuous. *l.* sometimes 2½ft. long. Brazil. Allied to *O. Cebolleta.* [T.]

O. stelligerum (star-bearing). *fl.* stellate, paniculate; sepals and petals yellowish, with many brown spots, oblong-ligulate; lip yellowish-white, with a darker yellow callus, the lateral lobes short, obtuse-angled, the isthmus narrow, the middle lobe roundish-cordate, shortly and abruptly cuspidate. Mexico. Allied to *O. hastatum.* [C.]

O. s. Ernesti (Ernest's). *fl.* pale yellow, with large, rounded, brown spots on the sepals and petals, and a reddish-purple front lobe to the lip. Mexico, 1887. (W. O. A. vi. 260.) [C.]

O. superbiens (superb). *fl.* 2½in. in diameter; sepals chocolate-brown, tipped yellow, long-clawed, the upper one much crisped, reflexed at apex, the lateral ones more ovate and less curved; petals smaller, yellow above, barred chocolate below, cordate-oblong, recurved, with a shorter and broader claw; lip blackish-purple, with a yellow crest, very small, revolute; panicle loose, flexuous, twenty to thirty-flowered; scape (and inflorescence) 2ft. to 3ft. long. *l.* about 1ft. long, linear-oblong, acute, keeled. Pseudo-bulbs elongate-ovate, compressed, about 4in. long. New Grenada, Venezuela. (B. M. 5980.) [T.]

O. tigrinum lugens (mournful). *fl.*, sepals and petals of a uniform, dark reddish-brown inside, the tips yellow, the dorsal keels green. 1886.

Oncidium—*continued.*

O. Warneri (Warner's). *fl.* five to eight in a short raceme; sepals oval, spreading; petals narrower and ascending; lip bright yellow, three-lobed, flat, the middle lobe deeply parted into two roundish lobes. Autumn. *l.* linear-lanceolate, recurved. Pseudo-bulbs ovate, ancipitous, two-leaved. Mexico. SYN. *Odontoglossum Warneri purpuratum* (B. R. 1847, 20). There are two varieties: *purpuratum*, sepals and petals white, streaked

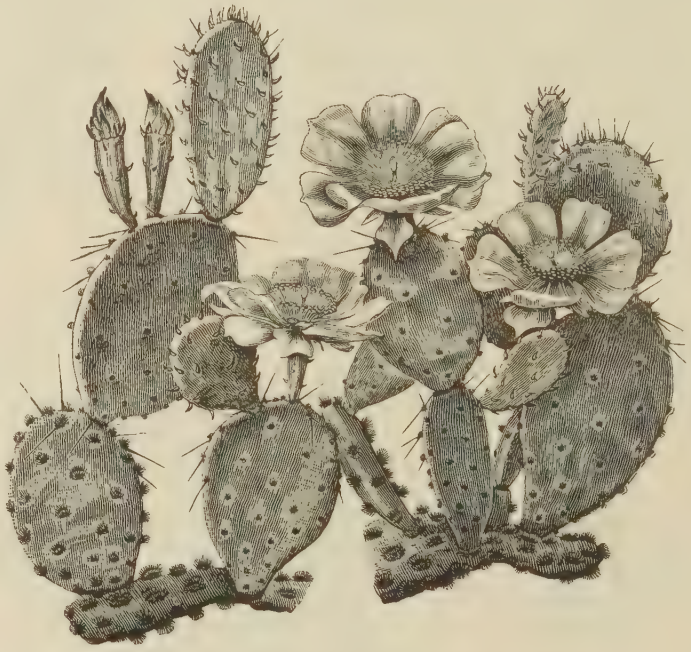

FIG. 50. FLOWERING BRANCHES OF OPUNTIA MACRORHIZA.

bright purple; *sordidum*, sepals and petals dull yellow, streaked purple. [C.]

ONCOMA. A synonym of **Oxera** (which *see*).

ONOSMA. To the species described on p. 498, Vol. II., the following should now be added:

O. pyramidalis (pyramidal). *fl.* drooping, disposed in nodding, short racemes; sepals ½in. long, narrow-lanceolate, free to the base; corolla bright scarlet, fading to lilac, about as long as the sepals, nearly ellipsoid, with a rather contracted, truncate mouth, sparingly pubescent. October. *l.*, radical ones numerous, rosulate, 10in. to 12in. long, nearly 1in. broad, narrow-lanceolate, acuminate, narrowed towards the base; cauline ones 4in. to 6in. long, sessile, lanceolate, acuminate. Stem 1½ft. to 2ft. high, stout, terete, pyramidally branched. Whole plant covered with white hairs. Western Himalayas, 1886. (B. M. 6987.)

OPLISMENUS. To the species described on p. 501, Vol. II., the following should now be added:

O. Burmanni albidulum (whitish). *l.* mostly white, with a green stripe along the midrib. India, 1886. A pretty, stove or greenhouse Grass, of dwarfer and more compact habit than the common variegated form, *O. B. variegatus* (*Panicum variegatum*, of gardens).

OPUNTIA. To the species described on pp. 502-4, Vol. II., the following should now be added:

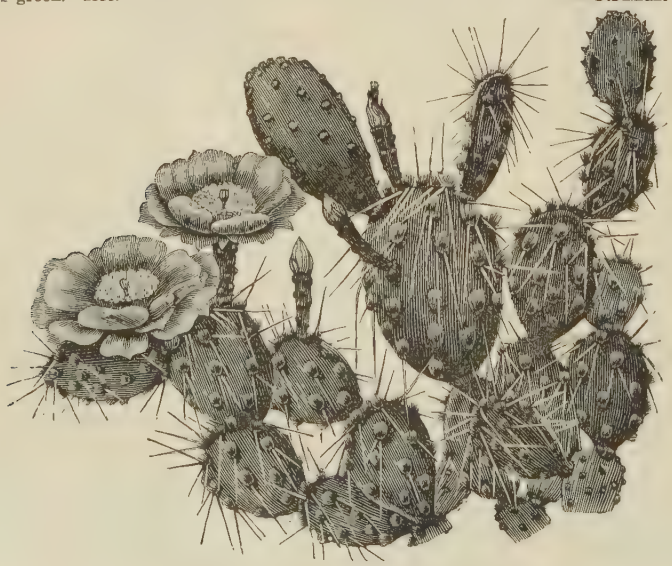

FIG. 49. FLOWERING BRANCHES OF OPUNTIA FILIPENDULA.

Opuntia—*continued.*

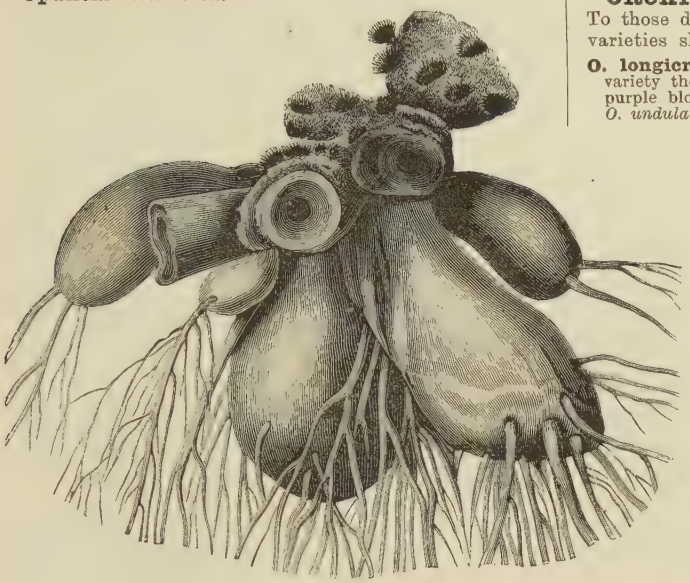

FIG. 51 ROOTS OF OPUNTIA MACRORHIZA.

O. filipendula (drooping-threaded). *fl.* purplish, 2½in. in diameter, very handsome. May and June. Stems about 1ft. high, spreading; joints flat, round or oval, about 3in. long, often less, bluish-glaucous; cushions ¼in. apart, composed of a little tuft of white, woolly hair, and a cluster of erect, rather strong bristles; spines usually one to each cushion, slender, deflexed, white, 1in. to 2in. long, but absent from some joints. Mexico. Stove. See Fig. 49.

O. macrorhiza (large-rooted). *fl.* yellow, large and beautiful. Summer. Stems cylindrical at maturity; joints flattened, battledore-like, with deciduous spines longer than the tufted bristles on the stems, the newly-developed joints having small leaves; roots thick and fleshy, having the appearance of potatoes, and supposed to be edible. Texas. This species resembles *O. Rafinesquii*. See Figs. 50 and 51.

O. rosea (rosy). *fl.* bright rose, 2in. across, borne on the ends of the ripened growths of the year, usually clustered. June. Stem erect, freely branching; joints 2in. to 6in. long, cylindrical; tubercles ridge-like, bearing on their points small cushions of very fine bristles, and tufts of pale yellowish spines about ½in. long all pointing upwards. Brazil. A distinct and handsome, but rare species. See Fig. 52.

ORCHIDANTHA (from *Orchis*, an Orchid, and *anthos*, a flower; in allusion to the Orchid-like appearance of the flowers). ORD. *Scitamineæ*. A monotypic genus. The species is a very remarkable and interesting, stove, perennial herb, resembling a dwarf Heliconia in foliage, but with flowers like those of an Orchid. For culture, *see* **Heliconia**, on p. 128, Vol. II.

O. borneënsis (Bornean). *fl.* produced in short spikes close to the ground; sepals yellowish at base, purplish towards the apex, narrow linear-lanceolate, acute, 1in. long; petals blackish-violet, linear, obtuse, aristate, rather more than ½in. long; lip blackish-violet, linear, acuminate, 1in. long; stamens five. *l.* elliptic-oblong, acuminate, bright green, 6in. to 8in. long, 2½in. to 3in. broad; petioles 5in. to 10in. long. Borneo, 1886.

ORCHIS. The British Flora embraces nine species. To those described on pp. 520-1, Vol. II., the following varieties should now be added:

O. longicruris foliis-maculatis (spotted-leaved). In this variety the leaves are marked with large, irregular, brownish-purple blotches. 1884. (R. G. 1149, f. 3, under name of *O. undulatifolia foliis-maculatis*.)

O. maculata superba (superb). *fl.* rich mauve, spotted and blotched purple; spikes dense, about 1ft. long. May and June. *l.* dark green, spotted purple. *h.* 1½ft. A fine variety.

ORIXA. Included under **Celastrus** (which *see*).

ORNITHIDIUM. To the species described on p. 524, Vol. II., the following should now be added:

O. ochraceum (ochre). *fl.* very small; sepals and petals ochre, with a few mauve-purple spots, ligulate, acute; lip white, the disk of the anterior lacinia ochre, spotted mauve. *l.* cuneate-oblong, unequally acuminate, cartilaginous. Pseudo-bulbs elliptical, ancipitous. New Grenada, 1887.

FIG 52. PORTION OF FLOWERING PLANT OF OPUNTIA ROSEA.

ORTHOCHILUS. A synonym of **Eulophia** (which *see*).

OSMUNDA. To the varieties of *O. regalis* described on p. 530, Vol. II., the following should now be added:

O. regalis gracilis (slender). A graceful form, the fronds of which sometimes come up tinted. See Fig. 53, for which we are indebted to Messrs. W. and J. Birkenhead.

FIG. 53. OSMUNDA REGALIS GRACILIS.

OSTEOCARPUS (from *osteon*, a bone, and *karpos*, fruit). ORD. *Convolvulaceæ*. A genus of greenhouse herbs or sub-shrubs, founded by Philippi, only differing from *Nolana* in the very hard, bony fruit (whence the generic name). They thrive in sandy loam, and may be increased from seeds, or by cuttings of the young wood.

O. rostratus (beaked). *fl.* azure-blue, bell-shaped. Summer. *l.* scattered, terete. Branches pubescent. A remarkably pretty sub-shrub. (R. G. 1884, 1175, a-e.) SYNS. *Alona rostrata*, *Nolana rostrata*.

OSTROWSKIA (named by Regel, in honour of the Russian botanist, Ostrowski). ORD. *Campanulaceæ*. A monotypic genus. The species is a very handsome and distinct, hardy, perennial herb, requiring similar culture to the tall perennial species of **Campanula** (which *see*, on p. 253, Vol. I.).

O. magnifica (magnificent). *fl.* blue, on long stalks, disposed in a terminal raceme; calyx with a series of linear pores at the base of the long, linear, acute segments; corolla campanulate, 3in. long and broad. *l.* in whorls, large, lanceolate, acutely toothed. *h.* 4ft. to 5ft. Central Asia, 1887. (G. C. ser. iii., vol. iv., p. 65; J. H. xvii., 1888, p. 53; R. G. 1887, p. 639; R. H. 1888, 344.)

OTANDRA. A synonym of **Geodorum** (which *see*).

OXALIS. To the species and varieties described on pp. 540-2, Vol. II., the following should now be added:

O. catharinensis (Santa Catharina). *fl.* white, greenish at base; petals ½in. to ⅔in. long, narrow cuneate-oblong; peduncles terete, unbellately four to fifteen-flowered. *l.*, leaflets three, triangular, sub-sessile, 2½in. broad, cuneate at base, truncate at apex, green and glabrous above, paler or purplish and minutely hairy beneath; petioles 2in. to 8in. long. Rhizome branching, covered with fleshy scales. South Brazil, 1887.

O. imbricata flore-pleno (imbricated, double-flowered). *fl.* of a deep rose-colour, "as double as the most double of Chinese Primulas" (W. Watson), nodding; peduncles hairy. *l.* hairy. Port Elizabeth, 1886. (G. C. ser. iii., vol. ii., p. 681.)

OXERA (from *oxeros*, sour; in allusion to the acrid taste). SYN. *Oncoma*. ORD. *Verbenaceæ*. A genus embracing ten species of glabrous, often climbing, stove shrubs, natives of New Caledonia. Flowers whitish or yellowish-white, pedicellate, rather large; calyx four or five-cleft, or rarely sinuate-toothed; corolla limb four-cleft; perfect stamens two, long-exserted; bracts usually small; cymes dichotomous, pedunculate in the upper axils, or disposed in a terminal, trichotomous panicle. Leaves opposite, entire, coriaceous. Only one species has been introduced. It thrives in good, rich, loamy soil, and may be increased by cuttings.

O. pulchella (pretty). *fl.*, calyx of four green sepals, ½in. to ⅔in. long; corolla yellowish or faintly greenish-white, 2in. long, between funnel and bell-shaped, the lobes broadly oblong; cymes many-flowered. December. *l.* 2in. to 5in. long, petiolate; upper ones oblong, obtuse or sub-acute; lower ones longer, oblong-lanceolate, obtusely acuminate, entire or with shallow crenatures. 1886. A handsome climber. (B. M. 6938; G. C. ser. iii., vol. iii., p. 209; Gn. xxxiii., 510; J. H. xvi., 1888, p. 87.)

PÆONIA. The single varieties of this useful, hardy flower have recently taken a high position in the estimation of gardeners. There are something like 150 named garden Pæonies, and a very select group for ordinary establishments is as follows:

Single Herbaceous Pæonies. ACASTA, flesh-colour; ASTROCA, silvery-rose; BACELUS pink, yellowish centre; GOLIATH, crimson; GORDIUS, maroon; GORGONIUS, purple; JANUS, light purple; LEVONI, white; ORTHIA, white, rose margin; QUEEN OF MAY, French white.

Double Herbaceous Pæonies. ADELAIDE, pure white; ADONIA, rosy-purple; AGENORIA, cream; ANCONA, bright rose, large; ATALANTA, rose; BEATRICE KELWAY, flesh-colour; GLORY OF SOMERSET, soft pink, large; LABOLAS, purplish-rose, distinct yellow tip; LADY GWENDOLINE CECIL, rose, large and full; LADY LEONORA BRAMWELL, silvery-rose; MEDIA, pale rose, large; MEDUSA, rosy-lilac; MILLAIS, maroon; PEARL, white, with a pale rose tint; PRINCE HENRY OF BATTENBERG, purple; PRINCESS BEATRICE, pink outer petals, yellow and pink centre; PRINCESS IRENE, primrose centre, pink petals; PRINCESS MARY OF CAMBRIDGE, rose; PRINCESS OF WALES, flesh-colour; QUEEN VICTORIA, rose, broad outer petals; SIR FREDERICK LEIGHTON, purplish-crimson; THISBE, pale pink; VERTUMNUS, rosy-blush; VESPER, primrose, outer petals pinkish-blush.

Moutan or Tree Pæonies. ANTIGONUS, pale rose; HECATE, maroon, yellow stamens; ILLUSTRIS, rose; LAUTA, white and pale purple; LORD TENNYSON, violet-purple; MAGNIFICENCE, cerise; PHŒBUS, rose, tinted salmon; REGALIS, rose, handsome; VENOSA, white, flushed carmine.

PALICOUREA. To the species described on p. 8, Vol. III., the following should now be added:

P. jugosa (ridged). *l.* opposite, elliptic-oblong, dark, satiny green, with depressed midrib and veins, the under surface purple. Brazil, 1886.

P. nicotianæfolia (Tobacco-leaved). *fl.* ⅜in. long, shortly pedicellate; calyx pubescent, the lobes triangular; corolla pale yellow, tomentose, tubular, the lobes short, triangular, margined red; thyrse terminal or from one of the upper axils, 4in. to 7in. long, contracted. September. *l.* opposite, 5in. to 9in. long, 2in. to 3in. broad, elliptic-lanceolate or oblong, acuminate, rather membranous. Brazil. (B. M. 7001.)

PALLASIA (of L'Héritier). A synonym of **Encelia** (which *see*).

PANAX. To the species described on p. 14, Vol. III., the following should now be added. All are stove shrubs.

P. crispatum (crisped). *l.* densely disposed, triangular, pinnately divided, deep green, with several pairs of overlapping leaves and a terminal one, each of which is deeply incised and slightly toothed on the margins, thus imparting a crispy appearance; petioles and stem olive-green, spotted lighter green. Brazil, 1888.

Panax—*continued.*

P. fruticosum multifidum (much-cleft). *l.* broadly ovate and very obtuse in outline, tripinnatisect; ultimate divisions linear or linear-lanceolate, ¼in. to ½in. long, tipped with a short, white bristle, and often margined with bristle-tipped teeth. 1887.

P. lepidum (pretty). *l.* biternate, deep green, the leading division surpassing the others; lateral pinnules of the secondary divisions obliquely obovate, the inner portions of the two blades almost covering the small central pinnule, which is deflexed, and in some instances is scarcely more than rudimentary; outside margins deeply and irregularly incised, spinose-toothed. Brazil, 1883.

P. nitidum (shining). *l.* deep green, roundish-obovate, appressed at apex, the margins furnished with small, slightly spinose teeth, the front part with two, three, or more deep incisions; petioles and stems brownish or deep olive-green, spotted or marbled yellowish-green. Brazil, 1888.

P. ornatum (adorned). *l.* long, pinnate; pinnæ narrow-lanceolate, deeply toothed on the margins; petioles and stems dark brownish-green, freckled or spotted light green. Brazil, 1888.

PANCIATICA. A synonym of **Cadia** (which *see*).

PANCRATIUM. To the species described on p. 15, Vol. III., the following should now be added:

P. caribæum (Caribbean). *fl.* pure white, fragrant, six to twelve in a sessile umbel; perianth tube 2in. to 3in. long; segments linear, 3in. to 3½in. long; staminal cup regularly obconic, 1in. long, faintly two-toothed between the free tips of the filaments, which are 1½in. to 2in. long; peduncle acutely angled, little shorter than the leaves. *l.* a dozen or more, multifarious, lorate, acute, 2ft. to 3ft. long, 2in. to 3in. broad above the middle, narrowed to 1in. at the base. Bulb globose, 3in. to 4in. in diameter. West Indies. Stove. The correct name of this plant is *Hymenocallis caribæa.*

P. guianensis (Guiana). *fl.* disposed in clusters; segments narrow, drooping, curled and twisted; corona trumpet-shaped; filaments green; anthers yellow; scape erect. British Guiana, 1887. Stove. See Fig. 54, p. 584, for which we are indebted to Mr. Wm. Bull.

P. parviflorum (small-flowered). *fl.* small, seven or eight in an umbel: stamens having a broad base, with an erect tooth on each side; scape shorter than the leaves. Summer. *l.* broad, linear, acuminate. 1885. Greenhouse.

PANDANOPHYLLUM. Included under **Mapania** (which *see*).

PANDANUS. Including *Barrotia.* To the species described on pp. 16-18, Vol. III., the following should now be added:

P. Augustianus (Auguste's). This is closely related to *P. Kerchovei.* The leaves are larger and more densely serrated, the nerves being green and denticulated, and the stem is broader. Papua, 1886. (I. H. 1886, 612.)

P. Grusonianus (Gruson's). *l.* numerous, very narrowly linear-lanceolate, densely serrated from base to apex, the teeth brilliant red, acute, the midrib keeled below and slenderly spicate. Stem short. Amirantes Islands, 1887. (I. H. ser. v. 12.) SYN. *Barrotia Grusoniana.*

P. Kerchovei (Comte de Kerchove's). *l.* very narrow, attenuated and acute at apex, densely toothed, the middle nerve keeled below, the lateral ones numerous, one or two of the primary ones keeled above, confluent towards the apex; teeth greyish-white. Stem short, attenuated. Amirantes Islands, 1886. (I. H. 1886, 600.)

PANICUM. To the species described on pp. 18-19, Vol. III., the following variety should now be added:

P. italicum japonicum (Japanese). A form of the common Millet, with pendulous inflorescences, cultivated in Turkestan. It is probably native throughout Eastern and Southern Asia. *h.* 1½ft. (R. G. 1887, p. 278, f. 72.)

PANSY. This has always been a favourite, not only on account of the rich, brilliant, and varied colours, beautifully contrasted with the softer shades, pale blue and violet, but also for the sweet and very delicate perfume, and because plants may be obtained in blossom during every month in the year without forcing, but with the aid of a garden frame during the time of frost and snow. No plant sooner exhausts itself by blossoming; and as soon as the flowers show evident signs of inferiority, the old plants must be renovated by a rich surface-dressing, and a succession of young ones must be maintained. The recently-introduced varieties are all worthy of careful culture. A few of the best are here given:

Pansy—*continued.*

Fancy Pansies.

AGNES MITCHELL, dense dark blotch, upper petals white, purple band; ALEXANDER OLLAR, purple-maroon blotch; BEATRICE MARY MAXWELL, maroon blotch, with white margin; CATHERINE AGNES, rosy-purple and white, violet blotch; DAVID CHRISTIE, chocolate blotch, whitish margin; GEORGE CARLOW, upper petals purplish, black blotch; GEORGE C. TREVELYAN, purplish self, dark blotch; GEORGE INNES, brownish-maroon blotch, yellow margin; GEORGE WOOD, crimson, dark blotch; JOHN MCCOLL, purple blotch on yellow ground; JOHN POPE, yellow, with dark blotch, very fine; JUBILEE, chocolate blotch on yellow ground, upper petals crimson; MARY ANDERSON, deep yellow, dark blotch, upper petals purplish; MISS BLISS, brownish-red and yellow, edged white, handsome form; MISS KATE GRIEVE, upper petals crimson, with chocolate blotch; MISS LIZZIE MATTHEWS, creamy-white, with pale purplish blotch; MR. G. P. FRAME, dark maroon blotch, crimson, with white margin; MRS. FORBES, reddish-maroon blotch, purplish petals, with whitish margin; MRS. J. C. HOPE VERE, purple blotch, yellow edge, upper petals crimson; MRS. MELDRUM, white, violet blotch; MRS. SCOTT PLUMMER, bronze and yellow; WILLIAM STEWART, dark maroon blotch, upper petals purple and yellow.

Show Pansies.

Class I. Selfs. ALEXANDER BLACK, dark self, very fine, well-formed; ALPHA, white self, dense dark blotch; AYMER EDWARD MAXWELL, cream self, fine eye; BEACON, dark maroon, extra form and substance; CAPTAIN CROMBIE, dark maroon, fine quality; CHERUB, fine yellow; DEWDROP, white, dense violet blotch, very fine; DIMPLE, dark plum self, good form and substance; FIGARO, yellow, black blotch, fine show variety; FLAG OF TRUCE, white self, fine form, good substance; GARRY, rich dark self, fine and well-formed; GEM, golden-yellow, perfect form, good quality; HELEN DOUGLAS, large blotch, white, fine form; HIGHLAND MARY, white self, large and well-formed; JAMES HUNTER, dark self, finely-formed; J. DALZIEL, purple, extra fine; MRS. HORSBURGH, deep orange-yellow self; MRS. WILLIAM OLD, white self, violet-purple blotch, fine; MRS. WILLIAM WILSON, white self, large, well-formed; NEPTUNE, dark self, fine form; PETER LYLE, dark self, fine form and substance; THE MAHDI, very dark, well-formed.

Class II. White Grounds. BEAUTY, plum belt; BRORA, purple belt; ELSIE THOMSON, plum-purple belt, good form; FAIR MAID, broad, rich purple belt, large; LADY FRANCES, violet belt, well-formed; LOCHBUY, dark maroon belt, smooth; MISS JESSIE FOOTE, light purple belt, fine; MISS MEIKLE, purple belt; MISS MILLIGAN, light purple belt; MRS. A. FINLAYSON, purple belt, large and good form; MRS. GAIR, medium purple belt, fine form; MRS. J. S. ARMSTRONG, purple belt, very fine; MRS. RITCHIE, purple belt, large and constant.

Class III. Yellow Grounds. AMY, yellow, purple belt; ARDLER, purple belt, well-formed; CREMORNE, purple belt, dense dark blotch; DAVID DALGLEISH, bronzy-purple belt, fine; DR. D. P. STEWART, yellow, very clear, purplish belt; EBOR, dark bronzy belt; JANETTE, solid blotch, dark maroon belt; JOHN ELDER, maroon belt, extra fine; JOHN HARPER, bronze-purple belt, large; LIZZIE BULLOCK, purple belt, good form; LORD FREDERICK CAVENDISH, bronze-purple belt; MATTHEW BULLOCK, bronze-purple belt; MRS. MELVILLE, maroon-purple belt, pale yellow ground; PERFECTION, dark purple belt, fine form; THOMAS RITCHIE, deep purple belt.

PAPAVER. To the species and varieties described on pp. 20-2, Vol. III., the following should now be added:

P. bracteatum præcox (early). *fl.* deep sanguineous-crimson, somewhat smaller than those of *P. orientale.* May. Perennial.

PAPPERITZIA (so called after Papperitz, a friend of Reichenbach's, who discovered *Hymenophyllum tunbridgense* in Saxony). ORD. *Orchideæ.* A monotypic genus. The species is a small, stove Orchid, of botanical interest, allied to *Rodriguezia.* For culture, *see* **Burlingtonia,** on pp. 224-5, Vol. I.

P. Leiboldi (Leibold's). *fl.* green, small, with yellow bristles on the sepals and petals and some yellow on the lip; dorsal sepal conic-gibberose, with a tail-like apex, the lateral ones connate; petals oblong, aristate-acuminate; lip connate with the base of the column, forming a blunt pouch at the base, closed by a high, three-toothed crest; racemes lax, pendulous. *l.* 2in. to 3in. long, linear, acuminate. Mexico, 1886.

PASSIFLORA. To the species and varieties described on pp. 29-33, Vol. III., the following should now be added:

P. quadrangularis variegata (variegated). A variety differing from the type only in its leaves, which are freely covered with yellow spots and blotches.

Passiflora—*continued.*

P. violacea (violet). *fl.* 3in. in expanse; sepals and petals pale lilac, oblong, obtuse; outer coronal filaments blue in the middle, white at base and tips, the inner, violet ones shorter; peduncles long. *l.* three-lobed; stipules large, obliquely semi-cordate. Brazil, 1885. A beautiful, stove or greenhouse species. (R. H. 1885, p. 468.)

P. Watsoniana (Watson's). *fl.* about 3in. in diameter; sepals green with whitish margins outside, within white, flushed violet,

Passiflora—*continued.*

narrow-oblong, horned at apex; petals delicate lilac, similar to the sepals; corona of several rows of erect threads, the outer rows twice as long as the inner, violet, barred white. *l.* three-lobed, 2in. to 2½in. long, 3in. broad, green above, violet beneath. Brazil (?). Greenhouse. (G. C. n. s., xxvi., p. 648.)

FIG. 54. INFLORESCENCE AND LEAVES OF PANCRATIUM GUIANENSIS (see p. 583).

PATTONIA. A synonym of **Grammatophyllum** (which *see*).

PAVETTA. To the species described on p. 35, Vol. III., the following should now be added:

P. montana (mountain). *fl.* pure white, Ixora-like, in terminal corymbs. *l.* long-petioled, oblong-lanceolate, acute. Java. A dense, free-growing plant, well adapted for pot culture.

P. natalensis (Natal). *fl.* snow-white, salver-shaped, with very long-exserted styles, disposed in handsome, densely cymose heads. *l.* lanceolate, dark, shining green. Natal, 1888. Stove shrub.

PELARGONIUM. The following selection includes the most recently introduced varieties, many of which are much superior to any of the old ones in richness of colour and perfection of form.

Show Pelargoniums.

AMBASSADOR, deep rose, distinct dark blotch on upper petals, well-formed; BLUEBEARD, light purple, whitish centre, upper petals shaded darker, large flowers, good habit; CORINNA, lower petals lilac-rose, upper ones maroon with lighter edge, white centre; CRUSADER, lower petals bright red, crimson-shaded, upper ones dark, distinct and free; DUKE OF CLARENCE, lower petals scarlet, upper ones maroon, shaded edge, fine shape; DUKE OF NORFOLK, crimson-scarlet, dark upper petals, and light centre; EXCELLENT, lower petals light crimson, upper ones maroon-crimson, well-formed; EXPRESS, lower petals rosy-purple, upper ones dark, with narrow, rose edge; FRANCES, rosy-purple, dark blotch on upper petals, well-formed; MARION, lower petals rosy-purple, dark blotch on upper ones, narrow rose edge, white centre; MARQUIS, rose, dark blotch on upper petals, white centre, well-formed; MYSTERY, lower petals rosy-salmon, upper ones dark maroon, rose edge, light centre; PLATO, soft rose, dark blotch on upper petals, shaded lighter edge, white centre; WRESTLER, orange-red, maroon blotch on upper petals, white centre, large.

Decorative Pelargoniums. Spotted and Fringed.

ECLIPSE, salmon-red, dark blotch on all the petals, dwarf and free-flowering; EDWARD PERKINS, orange-scarlet, dark blotch on upper petals, extra fine; HARRY BUCK, upper petals crimson, blotched maroon; MONARCH, blush-white, maroon-crimson blotch, dwarf habit; PRINCESS MAUD, crimson, shaded white edge, white centre; RADIANT, red, lightly feathered crimson, heavily blotched dark red on upper petals, excellent habit; THE BARD, rosy-crimson, dark blotch on upper petals, dwarf, bushy habit.

Fancy Pelargonium.

AMBASSADRESS, soft lilac-rose, with a white centre, well-formed flowers.

Zonal and Nosegay Pelargoniums.

Single-flowered Varieties adapted for Pot Culture. ALEXANDER ALBRECHT, rich, dark scarlet, large truss (also a good bedding-out variety); AUREA PERFECTA, orange-yellow, a greatly improved JEALOUSY, but habit not good; CHARLES MASON, scarlet-vermilion, large pips and truss, the best scarlet variety yet raised: EDITH LITTLE, delicate rosy-blush, large truss; EDITH STRACHAN, pale salmon, large and well-formed pips, good habit; ELLEN CLARK, orange-salmon, good habit, very profuse-flowering variety; FALSTAFF, scarlet and plum-colour, large truss, free-blossoming habit; INTERNATIONAL, white, lightly tinged pink, of large size and excellent form; JOHN L. BALDWIN, vermilion-scarlet, perfectly-formed pips, plant dwarf and free; LADY FRANCES RUSSELL, delicate pink, white centre, well-formed; LORD TREDEGAR, scarlet, suffused plum, immense flowers of excellent form; MARY CLARK, pinkish-salmon, with orange tinge, plant free in growth and of good habit; M. MYRIEL, crimson, white centre, the best-formed flowers in this colour; MRS. BARKER, rose, well-formed pips and large truss, good habit, the best in its colour; MRS. DAVID SAUNDERS, lilac-pink, large pips; MRS. MILLER, rich crimson, pips well-formed; PERDITA, salmon, paler edge, very delicate colour, dwarf plant, of free growth; QUEEN OF WHITES (improved), very pure, well-formed, pips of medium size; REV. DR. MORRIS, very rich vermilion-scarlet, good shape and large truss; REV. R. P. HARRIES, pale salmon-rose, large truss, free in growth; SAM JACOBY, a seedling from H. JACOBY, of a richer and darker colour; W. BEALBY, light rosy-scarlet, well-formed pips, dwarf plant; WEDDING RING, orange-yellow, with the distinct colour of its parent JEALOUSY, but of a free-branching habit.

Single-flowered Varieties adapted for Bedding. CORSAIR, bright scarlet; HAVELOCK, dark scarlet; LUCY MASON, salmon-pink, suffused with orange; REV. HEY, rosy-red, dwarf plant.

Double-flowered Varieties adapted for Pot Culture. AGLAIA, cerise, very good habit, one of the very best double Zonals; CORINNA, delicate blush-pink; GOLDFINDER, yellowish-orange, dwarf plant, of free growth, extra fine; LORD MAYOR, pink, dwarf plant, free-flowering, good winter-blossomer; MADAME DALLOY, pinkish-blush, well-formed pips; MOLIÈRE, rosy-pink, good pip and habit; MRS. CORDEN, cerise, a very pretty variety; RE UMBERTO, bright orange, very distinct.

Pelargonium—*continued.*

Ivy-leaved Pelargoniums.

Single-flowered. MADELEINE REITERHART, bright rose, very free flowerer, well adapted for pillar culture.

Double-flowered. ALICE CROUSSE, rich magenta, free in growth; FURSTIN JOSEPHINE VAN HOHENZOLLERN, rosy-red, pips very double, and well-formed; GALILEE, delicate lilac, a pretty shade; LE PRINTEMPS, rosy-pink, very free; MADAME DE WISCH, rosy-scarlet, shaded magenta, good pips and truss; MURILLO, rich crimson, dwarf habit; SOUVENIR DE CHARLES TURNER, rose, with purplish tint, large pips, one of the best.

PELECYPHORA. To the species described on p. 65, Vol. III., the following variety should now be added:

P. aselliformis pectinatus (comb-like). A variety with larger scales than the type. (R. G. 1885, p. 25, under name of *P. pectinatus.*)

PENNISETUM. To the species described on p. 69, Vol. III., the following should now be added:

P. giganteum (gigantic). *fl.*, spikes nodding, solitary or in pairs in the upper axils, slender, pedunculate. *l.* narrow linear-lanceolate. *h.* 5ft. to 6ft. 1884. An ornamental, stove Grass.

PENTSTEMON. To the species and varieties described on pp. 71-74, Vol. III., the following should now be added:

P. Cobæa purpurea (purple). *fl.* rich purple, sparingly shaded with violet, much larger than in the type; spikes four to six on established plants. 1882. A charming variety.

Varieties. The following is a selection of the latest garden varieties:

ALEXANDER, red, whitish throat, purple veins. BERLIOZ, violet, white throat. CYTHÈRE, deep red, white throat, purple edge. EMILE PALADILHE, amaranth, white throat; large. ESMERALDA, white and lilac. EUGENE LABICHE, purple, shaded red. GOUNOD, violet, white throat; large. LEVIATHAN, violet and white. MELPOMENE, violet, white throat, netted purple. MONT BLANC, pure white. ORPHÉE, white and lilac. PAUL BERT, fiery-red, white throat; fine. PERLE, mauve and white. VESUVE, deep red, white throat. VICTOR TISSOT, pale rose, salmon throat.

PERAMIUM. A synonym of **Goodyera** (which *see*).

PERESKIA. To the species described on p. 76, Vol. III., the following should now be added:

P. zinniæflora (Zinnia-flowered). *fl.* rosy-red, terminal on the ripened young shoots, and composed of a whorl of broad, overlapping petals, nearly 2in. across, with a cluster of stamens in the centre. Stem erect, woody, branching freely; branches bearing oval, acuminate, fleshy, wavy-edged, green leaves, with short petioles, and a pair of spines in the axil of each; spine cushions on old stems crowded with stout, brown spines. Mexico. A well-marked species, in the way of *P. Bleo.* See Fig. 55, p. 586.

PERISTERIA. To the species described on p. 79, Vol. III., the following should now be added:

P. læta (pleasing). *fl.* bright yellow, somewhat resembling those of *P. cerina;* sepals and petals spotted dark purple, the former oblong, the latter cuneate-rhomboid; lip with smaller spots than those on the sepals and petals; bracts ovate, triangular; raceme porrect, several-flowered. *l.* two or three, plicate, oblong-lanceolate, acuminate. Pseudo-bulbs pyriform. Origin unknown. 1887.

P. selligera (stool-bearing). *fl.* the same colour as those of *P. pendula*, the epichil being perhaps yellower; column armless; callus saddle-like, with deep, argute margins, covering the whole disk. Demerara, 1887. This is closely related to *P. pendula.*

PETUNIA. This free-growing plant still holds its own; and it will ever be popular in gardens where free-growing subjects are preferred to those with which greater skill is required to command success. Some of the recent double varieties are very handsome. A good addition to those described on p. 86, Vol. III., is given below.

Double Varieties. ADOLPHE WEICKE, crimson, with darker veins, neatly fringed white. ANTIGONE, deep lilac, shaded rose; large. ARC-EN-CIEL, rich purplish, lightly veined, prettily fimbriated. CÉLÉBRITÉ, pale rose, shaded lilac; large and well-formed. C. NODIER, rich purple. CRÉPUSCULE, purplish, with white tips; large and full. DIABLE BOITEUX, lilac; very large, doubly fimbriated. FRISURE, deep crimson. HERMINE, white, handsomely fringed. LA CHINE, rich reddish-purple, fimbriated. LA NUIT, deep crimson. MADAME SAUZER, rose, with lilac tint and darker veins, prettily fringed. M. BESSAUD, violet, crimson, and white; well-formed. MONT CENIS, creamy-white; large, fimbriated. MRS. BARCHARD, reddish-purple, with white margin.

Petunia—*continued.*

RUBENS, purplish-red; large. SHAKESPERE, rosy-lilac, veined maroon. TÉLÉPHONE, lilac-rose, veined magenta; large.

Single Varieties. ACROBATE, rose, tinged lilac, white throat, dark red reticulations; fine form. ALFRED, magenta, maroon throat. CELLINI, deep lilac, whitish throat, dull red veins. HARPOCRATE, carmine, white throat, purplish reticulations; large. JUNO, reddish-purple, with darker veins. MDLLE. DE LA SEIGLIÈRE, white, reticulated with violet lines; good form. MISS ALCOTT, deep pink, maroon veins, large. MISS C. TYRELL, rosy-purple, crimson veins, dark throat. MONOLOGUE, magenta, flaked white and shaded violet; large. THEMISTOCLE, clear red, white throat; large. VESUVE, bright red, marked purple and maroon; large.

FIG. 55. FLOWERING BRANCH OF PERESKIA ZINNIÆFLORA (see p. 585).

PHAIUS. To the species and varieties described on p. 90, Vol. III., the following should now be added:

P. Blumei (Blume's). *fl.*, sepals very acuminate; lip two-crested within, the limb semi-trilobed, the middle lobe largest, undulated. Java (grown in gardens).

P. callosus (thick-lipped). *fl.*, sepals and petals dull reddish-brown, tipped dingy-white, less numerous than in *P. grandifolius* (which this plant resembles in habit); lip white, with a tinge of pink, a dark purple spot beneath, and a little yellow on the two-lobed spur, truncate or almost two-lobed at the end, with a thick, callous line passing downwards along the middle. Java. (G. C. 1848, p. 287.) SYN. *Limodorum callosum.*

P. irroratus purpureus (purple). *fl.* having white sepals and petals, a dull rose lip, and a yellow throat. March and April.

P. Marshalliæ ionophlebia (violet-veined). *fl.*, lip having a sulphur-coloured disk and crest, with erose veins to the apex. 1885.

P. M. tricolor (three-coloured). *fl.* disposed in long, pendulous racemes; sepals and petals pure white; lip orange-yellow, marked crimson-purple. 1887.

P. Sedenianus (Seden's). *fl.*, sepals milk-white, washed with sulphur inside, lanceolate; petals lanceolate; lip large, broad, three-lobed, the lateral lobes broad, rhomboid, the middle one short, square, emarginate, blunt-angled, the borders broadly light purple, the disk sulphur, with three parallel keels; peduncle very strong, thirteen-flowered. 1887. Hybrid.

P. Veitchianus (Veitch's). *fl.* white, having the tips of the sepals and petals washed with very light mauve, and the lip with a fine mauve-purple anterior border and mauve-purple lines. 1885. An elegant garden hybrid between *P. Marshalliæ* and *P. Bensonæ.*

PHALÆNOPSIS. To the species and varieties described on pp. 91-3, Vol. III., the following should now be added:

P. alcicornis (elk's-horn). *fl.*, sepals and petals creamy-white, the former washed light yellow outside; lip having light yellow spots on the callus, the nail, and the base of the side laciniæ, the anterior lacinia having the keel of the mid-line yellow, and yellowish borders near the angles. 1887. Hybrid.

P. amabilis (lovely), of gardens. A synonym of *P. Aphrodite.*

P. Aphrodite Dayana (Day's). *fl.* very large; lower sepals dotted carmine over half their surface; side lobes of the lip deep yellow at the lower edge, the middle lobe trowel-shaped or hastate, marked carmine-crimson across the base, and striped carmine-crimson down the centre. Eastern Archipelago. SYN. *P. amabilis Dayana* (W. O. A. i. 11).

P. denticulata (toothed). *fl.*, sepals and petals white, spotted brown, cuneate-ligulate, acute; lip white, three-parted, the side partitions ligulate, light yellow on the anterior side, the median one cuneate-oblong-ligulate, acutish, with three mauve lines on either side. December. *l.* 6in. to 7in. long, 2in. to 3in. wide, green.

P. equestris (equine). A synonym of *P. rosea.*

P. Foerstermanii (Foersterman's). *fl.*, ground-colour white; sepals and petals cuneate-lanceolate, marked with thin, forked, or hieroglyphic, brown, transverse lines; lateral laciniæ of the lip scimitar-shaped, retuse, recurved, with a retrorse bristle, and an oblique keel outside, a yellow callus on the inner side of each, the middle lacinia tridentate at apex; peduncle two-edged. *l.* cuneate-obovate, unequally bidentate at apex. 1887.

P. gloriosa (glorious). *fl.* very conspicuous, set closely, and much resembling those of *P. amabilis.* *l.* broad at apex, light green on both sides, slightly silvered on the upper surface.

P. Harriettæ (Harriet Corning's). *fl.* 2½in. across; sepals and petals sulphur-white or pale primrose, dotted rosy-purple at base, the lateral sepals acute and distinctly keeled, the petals much broader; middle lobe of lip violet-crimson, the lateral ones rosy-purple above, with brown and purple spots below; scape one-flowered. *l.* oval, 2½in. to 4½in. long. 1887. A hybrid between *P. amabilis* and *P. violacea.*

P. John Seden. *fl.* 3in. in diameter; sepals and petals ivory-white, dotted light purple; lip three-lobed, white, the front of the side lobes suffused pale rose and dotted light purple, the base bearing a trace of yellow, dotted rosy-crimson; crest white, suffused pale rose, with a tinge of yellow, and bright rosy-crimson dots. *l.* oval-oblong, dark green. A hybrid between *P. amabilis* and *P. Luddemanniana.* (G. C. ser. iii., vol. iii., p. 332.)

P. Leda. *fl.* more than 2½in. across, resembling in shape those of *P. amabilis;* inner half of the lateral sepals purple-spotted near base; front lobe of lip densely covered with minute, rosy dots, with some yellow at its base, and the apex pure white; side lobes marked yellow on the front margin, and with a few purple spots below the middle, the stalk of the lip being marked with a few purple bars; crest yellow, spotted purple. *l.* elliptic-oblong, deep green. Hybrid, of doubtful origin.

P. Lobbii (Lobb's). A synonym of *P. intermedia.*

P. Luddemanniana hieroglyphica (hieroglyph-marked). *fl.*, sepals and petals ochre-white, narrower than in the type, with cinnamon, hieroglyphic markings; side laciniæ of lip very short, the middle one cuneate, narrow, with an unusually developed keel. *l.* 7in. to 8in. long, 2in. wide. 1887.

P. L. ochracea (ochreous). *fl.*, sepals and petals pale yellowish-rose, barred pale brown. Philippine Islands. (R. H. 1872, 390.)

P. Regnieriana (Regnier's). *fl.* rose-coloured, with a lip that is nearly wholly dark purple, and a dark purple column; side laciniæ of the lip small, triangular, the middle one much larger, oblong-lanceolate, apiculate, thickened beneath; peduncles nine to twelve-flowered. *l.* very thick, tapering. Siam, 1887.

P. Rothschildiana (Rothschild's). *fl.* resembling those of *P. leucorhoda;* sepals sulphur-yellow, the lateral ones spotted with purple at the lower part of the base; petals white, large, much rounded; side laciniæ of lip cuneate, rounded, yellow

FIG. 56. **PHILODENDRON ANDREANUM** (see p. 588).

Phalænopsis—*continued.*

at the lower outer margin, spotted purple, the middle one white, spotted red and marked orange. 1887. A cross between *P. Schilleriana* and *P. Aphrodite.*

P. Ruckerianum (Rucker's). A garden synonym of *Sarcochilus unguiculatus.*

P. Schilleriana advena (stranger). *fl.* almost spotless; sepals and petals pale purple; lip white, with a yellow callus and side lobes, and two rose-purple spots in front of the callus. 1885.

P. S. alba (white). *fl.* white, with the exception of the yellow crest, and a few yellow spots on the upper portion of the lip. 1882.

P. S. splendens (splendid). *fl.* rose, washed with a darker colour; side lobes of the lip white, spotted purple and washed rose. 1886. A handsome variety. (R. H. 1886, p. 396.)

P. S. vestalis (vestal). *fl.* white. Philippine Islands.

P. Stuartiana Hrubyana (Hruby's). *fl.*, sepals and petals purple at back, the upper sepal narrowly, the petals broadly, margined white, the inner border of the lateral sepals also white.

P. S. nobilis (noble). *fl.* longer in its parts than in the type; callus of the lip orange. 1882.

P. S. punctatissima (much-dotted). *fl.*, upper sepal, and upper and inner sides of the lateral ones, and petals dotted with mauve. 1882.

P. S. punctulata (slightly dotted). *fl.*, sepals and petals marked with numerous red dots. 1885. (L. i. 8.)

P. violacea Bowringiana (Bowring's). *fl.* pure, light yellow, with a broad dash of purple inside the lateral sepals, and some purple bands and freckles at the bases of the upper sepal and petals. Malayan Archipelago.

P. v. Schröderi (Baron Schröder's). *fl.* larger than in the type; sepals and petals wholly purple, broad; lip of a deeper amethyst-purple than in the type; raceme short, erect. *l.* bright green. 1882.

PHILODENDRON. To the species described on pp. 96-8, Vol. III., the following should now be added:

P. Andreanum (André's). *l.* pendulous, 2ft. to 3ft. long, 10in. broad, elongate-cordate-lanceolate, acute, dark, shining green, with coppery reflections. Columbia, 1886. A fine climber. See Fig. 56, p. 587, for which we are indebted to Messrs. James Veitch and Sons. (R. H. 1886, p. 36.)

P. nobile (noble). *fl.* axillary; tube of the spathe rosy-crimson both outside and within; lamina white within, the outside spotted with deep rose. *l.* obovate-lanceolate, acute. Stem climbing. South America, 1885. This resembles *P. crassinervium*, but is larger.

P. squamiferum (scale-bearing). *fl.*, spathe 3½in. to 4in. long, the tube reddish-purple, the lamina pale greenish-yellow and reddish-purple outside, whitish-yellow within; spadix oblique, sessile, 3in. long; peduncles twin, reddish, 3in. long. *l.* 6in. to 12in. long, 5in. to 10in. broad, pinnatifidly five-lobed; young ones entire or three-lobed; petioles 6in. to 12in. long, ¼in. thick, terete, reddish, densely bristly. Stem smooth. Brazil and Guiana, 1886. (I. H. 1886, 590.)

PHLOX. To the species and varieties described on pp. 100-3, Vol. III., the following should now be added:

P. Drummondii cuspidata (cuspidate). A dwarf variety, with peculiarly pointed flowers.

P. D. flore-pleno (double-flowered). A pretty, double-flowered form. 1886. (R. G. 1886, p. 404.)

P. D. hortensiæflora alba (Hortensia-flowered, white). *fl.* pure white, showy and beautiful, produced in large heads. 1882. A close-growing and compact form. (F. & P. 1882, p. 53.)

P. stellaria (starry). *fl.* white, more than 1in. across. March to June. *l.* 1in. to 2in. long. Stems dark, wiry.

Varieties. Perhaps in no previous season have Phloxes been finer than in the summer and autumn of 1888. They grew most vigorously, producing long, branched spikes of richly-coloured, brilliant flowers. The late-flowering varieties have quite superseded the early-flowering section in the drier and warmer climate of the South of England; but the *Suffruticosa* section are much esteemed in the cooler, moister districts of the North. The *Decussata* varieties are also more numerous, but it may be fairly said they are too numerous. Of good and distinct forms that have been recently introduced, the best are here given.

Phlox—*continued.*

Early-flowering Varieties (*Suffruticosa* Section). BURNS, deep rosy-purple, well-formed. CLIPPER, white, with lilac tint; well-formed spike. CONQUEROR, pure white, lilac eye: fine spike. EMPRESS, white, beautiful rose centre. JOHN C. DUKE, fine white, rose centre. KING OF PURPLES, dark purple, crimson eye. LADY KEITH MURRAY, pure white; handsome spike. MAGNUM BONUM, rosy-red, large, fine. MRS. JAMES WATT, white, pale purple eye; fine spike. MRS. J. HOPE, white, with a suffusion of rosy-lilac. MRS. KELWAY, white, rosy-lilac centre; good spike. MRS. MILLER, purplish; large spike. MRS. W. RICHARDS, white, with slight purple shade. NETTIE STEWART, white, with distinct lilac shade. PERFECTION, pure white, pale rose centre. PURPLE EMPEROR, rich purple; very large. REV. DR. HORNBY, white, striped rose, purple eye. ROSY GEM, pleasing dark rose-colour, fine form. STANLEY, deep rose, dark red eye; fine spike. WALTER GRAY, rosy-purple, dark eye.

Late-flowering Varieties (*Decussata* Section). AMBASSADOR, white, dark red centre, large. AMMONITE, lilac-rose, white centre, large. AUSTIN WITHERS, lilac, reddish eye; distinct. BACILLE, purplish-mauve, large, fine. BERLET, white, carmine centre. CAROT, white, fine, large. CHARLOTTE SAISSON, white, crimson centre. CORTAMBERT, white, deep red centre; fine spike. DIANA, white, purple eye, good form. DON JUAN, rosy-tinted, dark centre. EMPRESS, white, pinkish centre; fine spike. ERCKMANN-CHATRIAN, bluish-purple; compact spike. EUGÉNE TUNNER, white, crimson eye, fine. FRÉDERIC FAILLIE, white, tinged rose, carmine eye. GENERAL FROLOW, rosy-purple, fine, large. GIPSY QUEEN, rosy-lilac, crimson centre. JAMES DICKSON, lilac; fine form and spike. JOHN ALEXANDER, deep salmon, crimson eye. JOHN BRUNTON, rich, dark vermilion. LUCIE BALTET, pale purple-lilac; large spike. M. MAREY, deep rose, purplish-violet centre, fine. MRS. JAMES CLARK, lilac; large, handsome spike. MRS. R. MONRO, rosy-lilac, crimson centre. MRS. WHITEHEAD, rosy-lilac, carmine centre. NEIL GLASS, rosy-violet, dark purplish centre. P. NEILL FRASER, purplish-rose, fine form. ROBERT KNOX, deep salmon; large and fine spike. SHERIFF IVORY, pale rose, crimson eye. THE DEACON, rosy-purple, crimson eye. THE MCNEWMAN, rosy-crimson, dark eye. TOMBOUCTOU, pale rose, rich reddish centre. TOREADOR, rosy-salmon, darker centre.

PHŒNIX. To the species described on pp. 104-5, Vol. III., the following hybrid and variety should now be added:

P. hybrida (hybrid). A hybrid between *P. dactylifera* and *P. farinifera.* The stem is short and stout, while the leaves resemble those of *P. farinifera.* The fruits, when mature, are of a glaucous-red. Greenhouse.

P. rupicola foliis argenteo-variegata (silvery-variegated leaved). A beautiful variety, having leaves variegated with green and white. 1887. (I. H. ser. v. 3.)

PHORMIUM. This genus now embraces three species. To the species and varieties described on pp. 105-6, Vol. III., the following should now be added:

P. Hookeri (Hooker's). *fl.* on slender pedicels; sepals orange, linear-lanceolate, acute; petals green, linear-oblong, rounded and recurved at apex; filaments blood-red; scape inclined. July. *l.* ensiform, flaccid, recurved, torn at apex. *h.* 5ft. New Zealand. Hardy in the South-west of Britain. (B. M. 6973.)

P. tenax nigro-limbatum (black-bordered). *l.* glaucous-green, erect, rather broad, margined blackish-purple; the points split, both sides of each of the divided portions having the blackish-purple margin.

PHRYNIUM. To the species described on p. 109, Vol. III., the following should now be added:

P. variegatum (variegated). *l.* 5in. to 7in. long, 1½in. to 3in. broad, oblong, sub-acuminate at apex, rounded-obtuse at base, beautifully and irregularly variegated in dark and light greens and greenish-yellow; petioles 6in. to 7in. long, striped with green and white. Singapore, 1886. (I. H. 1886, 601.) See Fig. 57, for which we are indebted to Messrs. James Veitch and Sons.

PHYLLOCACTUS. To the species and varieties described on pp. 112-3, Vol. III., the following should now be added. They are well worth a place in collections of Succulents.

P. Cooperi (Cooper's), of gardens. *See* **P. crenato-grandiflorus.**

P. crenato-grandiflorus (hybrid). The handsome plant, with large, yellowish-white flowers, figured in R. G. 1176 under this name, is known in gardens as *P. Cooperi.*

FIG. 57. PHRYNIUM VARIEGATUM.

Phyllocactus—*continued.*

P. Haagei (Haage's). *fl.* flesh-coloured when first expanded, becoming carmine before fading, about 5in. across. See Fig. 58.

FIG. 58. FLOWERS OF PHYLLOCACTUS HAAGEI.

P. roseus grandiflorus (rosy, large-flowered). *fl.* white, 6in. long and broad, nodding. See Fig. 59.

PHYSURUS. To the species described on p. 117, Vol. III., the following should now be added:

P. fimbrillaris (fringed). *fl.* white; sepals marked outside by a central line of pellucid glands; lip yellow at the tip, which is delicately fringed. *l.* ovate, dark green, with silver veins. Brazil.

PHYTOLACCA. To the species described on p. 119, Vol. III., the following variety should now be added:

P. decandra albo-variegata (white-variegated). A form with variegated leaves. 1887. (R. H. 1887, p. 16, f. 2.)

PICEA. To the species and varieties described on pp. 121-3, Vol. III., the following should now be added:

P. alpestris (rock-loving). This resembles *P. excelsa*, but has the young shoots velvety, with stiffer, shorter, thicker leaves, about ½in. to ¾in. long, and more distinctly four-angled. Swiss Alps.

P. Breweriana (Brewer's). *l.* five to twelve lines long, one-half to one line broad, rounded or slightly keeled above, stomatose beneath on each side the prominent midrib, obtuse. *cones* slender, 3in. long, with thin, entire scales. Branchlets long, drooping, whip-like, puberulous. *h.* 80ft. to 90ft. North California, 1886. This tree somewhat resembles *P. excelsa*. (G. C. n. s., xxv., pp. 497-8.)

P. excelsa virgata (twiggy). This is identical with the form *monstrosa*.

P. Parryana (Parry's). A synonym of *P. pungens*.

Picea—*continued.*

P. pungens. Rocky Mountain Blue Spruce. "White, glabrous branchlets, stouter [than those of *P. Engelmanni*], in old specimens somewhat flattened, spiny-pointed leaves, blue in young trees and in the young growth of old trees; the cones are much longer and paler [than in *Engelmanni*], the bark thick, crooked, and greyish; leaves of seedlings somewhat denticulate" (Engelmann). A tall tree. SYN. *P. Parryana.*

PICOTEE. This, like the Carnation, is being steadily improved by cultivators, the greatest advance having been made in the Yellow-ground section. The under-mentioned varieties are not all new, but should be grown in all good collections:

Red-edged. DR. ABERCROMBIE (Fellowes), broad edge of deep red, on pure white ground; MRS. FULLER, broad red edge, on good white ground; WILLIAM SUMMERS (Simonite), a good old variety, with medium heavy edge.

Purple-edged. BARONESS BURDETT-COUTTS (Payne), medium purple edge, glistening white ground; JULIETTE (Fellowes), medium-edged purple, with broad, well-formed petals; MR. TUTTON (Payne), light edge, very pure white ground, neat; PRINCESS DAGMAR (Batten), broad margin of full purple, pure white ground.

Rose and Scarlet-edged. DUCHESS (Fellowes), light rose edge, good form, very large and full; FAVOURITE (Liddington), very large, with broad, smooth petals, the best light rose-edged Picotee; MRS. SHARPE (Sharpe), a heavy-edged rose, of fine quality, the white very pure; ORLANDO (Fellowes), well-defined light rose edge, good white petals, large.

Yellow and Buff Ground. AGNES CHAMBERS (Douglas), clear yellow, lightly edged pinkish-red, large and full; ALICE WAITE (Turner), pale yellow, light edge of crimson, well-formed; ALMIRA (Douglas), bright yellow, flaked on the edge with pink, very large and full; ANNIE DOUGLAS (Douglas), full yellow, heavily edged rose, superb form; BRIGHT STAR (Turner), clear yellow, edged crimson; BULLION (Turner), bright yellow, margined red; COLONIAL BEAUTY (Douglas), buff, heavily edged pink, large and full; DOROTHY (Douglas), bright buff, large, well-formed petals, edged and lightly flaked reddish-pink; NE PLUS ULTRA (Turner), light red edge, large, full, and well-formed; PRINCESS BEATRICE (Turner), petals narrowly edged crimson, broad and well-formed; PRINCESS MARGUERITE, large, well-formed flower, narrowly edged reddish-crimson; TERRA-COTTA (Douglas), terra-cotta, beautifully edged reddish-pink, large, full-formed.

PICRIDIUM (from *Picris*, and *eidos*, resemblance; in allusion to its affinity with *Picris*). SYN. *Reichardia.* ORD. *Compositæ.* Ten species have been referred to this genus, but not more than five or six are distinct as such: they are hardy, glabrous, annual or perennial herbs, natives of South Europe, North Africa, and Western Asia. Flower-heads yellow, long-pedunculate, homogamous; involucre campanulate, the bracts in several series; florets ligulate, five-toothed at apex. Leaves radical or alternate, toothed or pinnatifid. *P. tingitanum*, probably the only species in cultivation, is a perennial. It thrives in any fairly good garden soil, and may be increased by divisions.

P. tingitanum (Tangier). *fl.-heads* on squamose peduncles; outer involucral bracts squarrose. July. *l.* all runcinate-pinnatifid, semi-amplexicaul, denticulate. Stems branched. *h.* 1½ft. Tangier, &c.

PIERIS. To the species described on pp. 124-5, Vol. III., the following variety should now be added:

P. japonica elegantissima (most elegant). This garden variety only differs from the type in having the leaves prettily margined with white. SYN. *Andromeda japonica variegata.*

PIGAFETTA. This genus is named in honour of Ant. Pigafetta, an Italian, who accompanied Magellan in his voyage round the world (1519-22), and wrote an account of it.

PINANGA. To the species described on p. 130, Vol. III., the following should now be added:

P. decora (comely). *l.* pinnate, green, tinged brown: pinnæ sessile, broadly lanceolate, long-acuminate, sometimes bifid and rounded at the apex; sheaths marked brown. Caudex tall. Borneo, 1886. Unarmed. (I. H. 1886, 114.)

P. lepida (pretty). *l.*, when first developed, brownish-crimson, gradually changing to deep, lustrous green, with faint darker mottling; segments unequal, prominently veined above; petioles short, rufescent. East Indies, 1888. This Palm is only known in a young state in gardens.

P. Sanderiana (Sander's). *l.* two-lobed, spreading, glossy, mottled green; petioles mottled or freckled with brownish pubescence, destitute of spines. Indian Archipelago, 1885.

P. spectabilis (remarkable). *l.* dark green, with paler mottlings, silvery beneath, pinnate; young ones two-lobed. East Indies, 1886.

FIG. 59. FLOWER AND PORTION OF STEM OF PHYLLOCACTUS ROSEUS GRANDIFLORUS.

PINK. The recent additions to the garden Pinks have been neither numerous nor important. The following are, perhaps, the best:

Show or Laced Pinks. EMPRESS OF INDIA, medium lacing, dark red; EURYDICE, rosy-red lacing; MINERVA, very bright dark red lacing; MODESTY, reddish-purple lacing; PANDORA, broad lacing of rosy-red; ROSY MORN, large flowers, beautiful rose lacing; TOTTIE, bright red lacing.

PINUS. To the species and varieties described on pp. 141-6, Vol. III., the following should now be added:

P. koraiensis variegata (variegated). In this garden form the young leaves are whitish-yellow in colour. The plant is said to be a vigorous grower.

PIPER. To the species described on pp. 147-8, Vol. III., the following should now be added:

P. rubro-venosum (red-veined). *l.* alternate, entire, highly glabrous, five-nerved; nerves marked on the upper surface by irregular lines of rose-colour; stipules adnate to the petioles. 1886. (I. H. 1886, 33.)

PIPTANTHUS. To the species described on p. 148, Vol. III., the following variety should now be added:

P. tomentosus (downy). This resembles *P. nepalensis*, but it is clothed in all its parts with silky tomentum. Yun-nan, China, 1887.

PITCAIRNIA. To the species described on pp. 150-1, Vol. III., the following should now be added:

P. arcuata (arched). *fl.* 3in. long; sepals carmine and yellow; petals pale yellow; bracts lanceolate, brownish-red on the lower part of the stem, bright carmine on the narrow-cylindric spike. *l.* petiolate, lanceolate, acute, 2½ft. to 3ft. long, 3in. to 4in. broad; petioles spiny. Stem arching, as long as the leaves. Andes of Columbia, 1886. SYN. *Neumannia arcuata* (R. H. 1886, p. 108).

P. nigra (black). *fl.* violet, long, subtended by large, recurving, rich coral-red bracts; spike elongated. *l.* petiolate, oblong-elliptic, acute, green. 1883. A handsome and very distinct plant. SYN. *Neumannia nigra* (R. H. 1881, p. 390).

P. Roëzlii (Roëzl's). *fl.*, sepals coral-red; petals cinnabar-red, thrice as long as the sepals, connivent in a helmet; bracts downy. *l.* long-lanceolate, ascending, arcuate, sessile, furfurescent on both sides, channelled, unarmed. 1885. Stems red. Andes of Peru. Plant tufted. (B. H. 1885, 18-19.)

PITTOSPORUM. To the species described on pp. 153-4, Vol. III., the following should now be added:

P. eugenioides variegatum (variegated). *l.* elliptic-oblong, pale green, bordered white. Stems and branches blackish-purple. New Zealand. Greenhouse, evergreen shrub.

P. flavum (yellow). A synonym of *Hymenosporum flavum*.

P. rhytidocarpum (wrinkled-fruited). *fl.* white, disposed in terminal, crowded umbels. *l.* obovate or oblanceolate, shortly acuminate. Fiji. 1887. A pretty and useful, greenhouse shrub.

PLATYCLINIS. To the species described on p. 158, Vol. III., the following should now be added:

P. cucumerina (cucumber-like). *fl.* light, pellucid green, arranged in a graceful, distichous raceme; lip with a toothed, brown auricle on each side of the base, running out into a narrow, aristate process; middle lobe obcuneate, retuse, apiculate, with two brown stripes on the disk. *l.* shining. Pseudo-bulbs cucumber-like, at length furrowed, tufted. 1885. SYN. *Dendrochilum cucumerinum*.

PLERANDRA (from *pleres*, full, and *aner*, *andros*, a male; in allusion to the numerous stamens). Including *Bakeria* and *Nesopanax*. ORD. *Araliaceæ*. A small genus (four species) of stove, unarmed, glabrous trees, natives

Plerandra—*continued.*

of Fiji. Flowers polygamous (?); calyx entire or sinuate-toothed; petals five, valvate, calyptrate, cohering or rarely free; stamens numerous, in two or several series; umbellets pedunculate. Fruit often rather large. Leaves ample, digitately compound; leaflets coriaceous, entire. Only one species has been introduced. For culture, *see* **Trevesia,** on p. 77.

P. Græffei. *See* **P. Grayi.**

P. Grayi (Asa Gray's). *fl.* greenish; umbellets twenty-six-flowered; umbels many-rayed. *fr.* ⅜in. long, ⅛in. in diameter. *l.* digitate; leaflets nine, obovate-oblong, obtuse, attenuated to the petioles, the upper ones 6in. to 7in. long, and 2½in. broad. 1887. Wrongly called *P. Græffei.*

P. vitiensis (Fijian). *fl.* green, disposed in large, compound umbels. *l.* digitate; leaflets five to ten, petiolate, elliptic-obovate, blunt at apex. Stem unbranched. 1887. A small tree. SYNS. *Bakeria vitiensis, Nesopanax vitiensis.*

PLEUROTHALLIS. To the species described on p. 163, Vol. III., the following should now be added:

P. atropurpurea (dark purple). The correct name of this plant is *Cryptophoranthus atropurpureus.*

P. glossopogon (bearded-tongued). A garden synonym of *P. insignis.*

P. insignis (remarkable). *fl.* pale, pellucid whitish-green, 2⅜in. long; upper sepal with three dull purple stripes, long-attenuate above, the lower connate pair having three dull purple stripes near the margin; petals with a broad base, bristle-like above; central lobe of lip dark blackish-purple, ligulate, villous at apex, the side ones half as long, falcate-linear; peduncle two-flowered. *l.* sessile, oblong or linear-oblong, 3⅜in. long. 1887. SYN. *P. glossopogon* (of gardens).

P. liparauges (bright-beaming). *fl.* light reddish-ochre, pellucid, remarkably thin; sepals linear; petals nearly so, but broader at the base; lip light ochre, with an orange margin at the apex, oblong, blunt-acute, rounded at base; column green, semi-terete, with angular wings. *l.* petiolate, oblong, blunt-acute, the upper surface spotted mauve-purple, the lower nearly wholly mauve. Brazil, 1885. A small species.

P. macroblepharis (large-fringed). *fl.* resembling those of *B. Barberiana,* but with narrowly acicular petals and a flat, hairy lip. *l.* longer and more acute than those of the species just alluded to.

P. maculata (spotted). A synonym of *Cryptophoranthus maculatus.*

P. Regeliana (Regel's). *fl.* gaping; dorsal sepal ochreous, erect; lateral ones reddish, declinate, connate; petals whitish; lip rose-coloured, with some purple marks at base, unguiculate, oblong-ligulate; bracts ochreous; peduncle short, recurved. *l.* very coriaceous, rounded at base, oblong or ovate-oblong, the apex slightly emarginate. Stem climbing. Minas Geraes, Brazil, 1886. (R. G. 1886, p. 51.)

P. tribuloides (Tribulus-like). *fl.* brick-red, very small, numerous. *h.* about 2in. Jamaica, 1887. An inconspicuous species.

PLUMBAGO. To the species described on pp. 169-70, Vol. III., the following variety should now be added:

P. capensis alba (white). A variety having white flowers. 1886.

POA. To the species described on p. 171, Vol. III., the following should now be added:

P. flabellata (fan-shaped). *fl.*, spikelets compressed, about five-flowered; glumes sub-equal; paleæ unequal, the outer ones acuminate, somewhat awned; panicle oblong, dense, compressed. *l.* highly glabrous, convolute, acute, rigid; lower ones flabellate, distichous. Falkland Island, Cape Horn, &c. SYNS. *Dactylis cæspitosa* (R. G. 1194, 1197), *Festuca flabellata.*

PODOCYTISUS CARAMANICUS. A synonym of **Laburnum caramanicum** (which *see,* on p. 224, Vol. II.).

POGOGYNE. To the species described on p. 175, Vol. III., the following should now be added:

P. nudiuscula (nearly naked). *fl.* bright blue, about ½in. long, bilabiate, whorled. Summer. *l.* tufted, linear, obtuse, glabrous. Branches slender, puberulent. *h.* 9in. to 12in. California, 1886. A pretty, dwarf, compact annual. (R. G. 1241.)

POGONIA. To the species described on p. 175, Vol. III., the following should now be added;

P. Barklyana (Sir Henry Barkly's). *fl.* green, with a darker green flush; sepals lanceolate, acuminate; petals broader and shorter; lip trifid, the side laciniæ angulate, the middle one acuminate, reflexed at apex; peduncle nearly 2ft. long, sometimes eleven-flowered. *l.* large, roundish, apiculately sinuate cordate at base, 9in. broad; petioles 9in. high. 1885.

POLEMONIUM. To the species and varieties described on p. 177, Vol. III., the following should now be added:

P. cæruleum himalayanum (Himalayan). *fl.*, corolla 1½in. in diameter, the segments lilac-blue, round; panicle axis and calyx very hairy. Himalayas.

P. flavum (yellow). *fl.* light yellow, 1in. in diameter; corolla infundibular-campanulate, glandular-puberulous; cymes corymbose. September. *l.* pinnate; leaflets many-jugate, elliptic-lanceolate, acute. Stem 2ft. to 3ft. high, simple or corymbosely branched, loosely tomentose above. New Mexico. (B. M. 6965.)

POLYGONUM CRISPULUM. A synonym of **Atraphaxis buxifolius** (which *see*).

POLYPODIUM. To the species and varieties described on pp. 186-95, Vol. III., the following should now be added:

P. caudiceps (tail-headed). *rhiz.* long, slender, creeping. *sti.* slender, 2in. to 4in. long. *fronds* simple, glabrous, oblong-lanceolate, 6in. long, 1in. or rather more broad, tapered below to a narrow wing, the apex drawn out into a narrow, attenuated point or tail (hence the specific name). *sori* round, naked, produced on the lowest veinlet. Formosa, 1886. An elegant basket Fern. SYN. *Goniophlebium caudiceps.*

P. fossum (ditch-loving). *rhiz.* slowly creeping. *fronds* about 1ft. long, varying from linear-lanceolate to ovate, the edges sinuately toothed or lobed; lobes longer or shorter according to the breadth of the frond, simple or bifid, or in the broadest fronds multifidly flabellate, deep green above. *sori* large, roundish, sunk in deep cavities which form a line of bosses on the upper surface. 1882. A distinct and interesting, evergreen Fern, well adapted for basket culture. SYN. *Pleopeltis fossa.*

P. grandiceps (large-headed). *fronds* arising at intervals from a slender, creeping rhizome, simple, oblong-lanceolate, leathery, about 6in. long and 1in. broad, tapering below into a narrow wing. Formosa, 1885. A dwarf Fern, suitable for basket culture. SYN. *Goniophlebium grandiceps.*

P. macrourum (long-tailed). This resembles *P. Phymatodes* in habit and size, but is distinguished by its long-tailed fronds, which are rhomboid-caudate, 2ft. to 3ft. long, 6in. to 12in. broad, bright green, the lanceolate tail having its middle part pinnatifid. Queensland (?), 1886.

P. Meyenianum (Meyen's). Bear's-paw Fern. *rhiz.* stout, with bright ferruginous scales ¼in. long. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad, the lower part cut nearly to the rachis into erecto-patent, linear-oblong, blunt, entire lobes, 3in. to 6in. long, ⅓in. to 1in. broad, the upper part pinnate, with numerous close pinnæ, 4in. to 8in. long, which consist only of a firm midrib with a row of small, round lobes on both sides, each with a sorus that covers it. Philippines. SYNS. *Aglaomorpha Meyenianum, Drynarium Meyenianum, D. philippense* (of gardens).

P. Picoti (Picot's). *fronds* numerous, arching, wavy, elongate-oblong, entire, coriaceous, 3ft. long or more, 4in. to 6in. broad, green and very shiny above, glaucous-green beneath. Brazil, 1886. A noble greenhouse Fern, of vigorous habit. (R. G. 1886, p. 206, f. 62.)

P. vulgare variabile cristatum (variably crested). *fronds* irregularly branched, cornute, conglomerate. 1882. This is also known as *glomeratum.*

P. Xiphias (swordfish). *rhiz.* stoutish, creeping, with brownish scales. *fronds* glabrous, more than 1ft. long, elliptic-oblong or somewhat obovate, caudate-cuspidate, narrowed below to the point of attachment; veins pinnate, reticulated. *sori* round, medium-sized, dotted over nearly the whole back of the frond. South Pacific Islands. The specific name refers to the shape of the fronds. SYN. *Pleopeltis Xiphias.*

POLYSCIAS (from *polys,* much, and *skias,* shade; in allusion to the plentiful foliage). ORD. *Araliaceæ.* A genus comprising about eight species of stove, glabrous trees or shrubs, inhabiting the East Indies, the Indian Archipelago, and the South Pacific and Mascarene Islands. Flowers umbellate, racemose or paniculate; calyx truncate or repand-toothed on the margin; petals five to eight, valvate, free, or cohering at apex; stamens as many as the petals; disk flat or rarely sub-conical; bracts scale-like or wanting. Leaves pinnate; leaflets coriaceous, usually ample. Only one species calls for description here. For culture, *see* **Trevesia,** on p. 77.

P. paniculata (paniculate). *fl.* not yet produced in this country, although a plant at Kew has been in cultivation over ten years. *l.* pinnate; leaflets usually seven, the terminal one 7in. to 9in. long, the others short-stalked, oblong, obtuse, shining, sub-coriaceous, deltoid or rather rounded at base, 4in. to 6in long. SYN. *Terminalia elegans* (of gardens). This "has no more to do with the genus *Terminalia* than with a Cabbage" (G. C. ser. iii., vol. ii., p. 366).

POLYSTACHYA. To the species described on p. 196, Vol. III., the following should now be added:

P. leonensis (Sierra Leone). *fl.*, upper sepals and petals light green; lateral sepals suffused brownish-purple in the lower half; lip white, the lateral lobes suffused behind with light purple, and the front lobe, the central keel, and the basal part of lip white-mealy. May. Bulbs globose-depressed, ½in. across, arranged in a string along the creeping rhizome so thickly as to touch each other. Sierra Leone, 1888.

PONTHIEVA. To the species described on p. 198, Vol. III., the following should now be added:

P. grandiflora (large-flowered). *fl.* large; lateral sepals connate for nearly all their length, white, blotched green at base; dorsal sepal narrow-lanceolate; petals halbert-shaped, twisted, yellow, striped Indian-red; lip small, fleshy, red; scape 9in. high; raceme eight to ten-flowered. *l.* broad, ovate, acute, dull green, hairy. Ecuador.

POPULUS. To the species and varieties described on pp. 200-1, Vol. III., the following should now be added:

P. Eugenii (Eugene Simon's). A garden variety of *P. monilifera.*

P. monilifera Eugenii (Eugene Simon's). A tree of giant size. It "carries its limbs and shoots perpendicularly, forming a columnar head. It grows faster than other varieties, and is well adapted for planting as a solitary tree in parks or in groups, but not by roads or streets" (C. Mathieu, in R. G., Dec. 1, 1887).

PORTEA TILLANDSIOIDES. The correct name of the plant described on p. 30, Vol. I., as *Æchmea Ortgiesii.*

PORTULACA. To the species described on p. 202, Vol. III., the following should now be added:

P. grandiflora Regeli (Regel's). *fl.* of a peculiar salmon-buff tint, with a yellow centre, solitary. 1885. (R. G. 1209.)

P. somalica (Somali Land). *fl.* bright yellow, 1in. in diameter, disposed in terminal clusters of three. *l.* scattered, terete, acuminate. *h.* 8in. to 10in. Somali Land, North-east Africa. 1886. A stove succulent, of botanical interest.

POTHOS. To the species described on p. 213, Vol. III., the following should now be added:

P. argentea (silvery). *l.* ovate, acuminate, inequilateral, of firm texture; upper surface silvery-grey, with an irregular band of deep green extending nearly the whole length of the midrib, and an irregular margin of the same colour. Borneo, 1887.

P. elongata (elongated). *l.* ovate-elongated, 12in. to 14in. long, 6in. to 10in. broad, coriaceous, dark, shining green. 1885. This is useful for covering walls, &c. Probably a species of *Scindapsus.*

P. flexuosa (bent). *l.* alternate, oblong, with an acuminate, deflexed apex, and a few alternate, elongated ribs. Stems flattened, rooting.

P. nigricans (blackish). *l.* spreading, 5in. to 6in. long, shining blackish-green. 1886. An ornamental climber, suitable for covering pillars or trellis-work.

P. nitens (shining). *l.* ovate, acute, slightly and unequally cordate at base, dark, shining bronzy-purplish-green. Stems terete. Eastern Archipelago, 1887.

PRIMULA. Within the last two or three years, a considerable impetus has been given to Primula cultivation, and a large number of new and rare species and hybrids have been introduced to English gardens. Undoubtedly, the most extensive collection is that of the Royal Botanic Gardens, Kew; Mr. D. Dewar—foreman of the Herbaceous Department—who has charge of it, has kindly prepared the following descriptions, and has corrected, from personal observation and study of the plants in a living state, a number of errors common to Primula nomenclature, &c. Those specially interested in Primroses should consult the "Report of the Primula Conference," forming Vol. VII., No. 2, of the "Journal of the Royal Horticultural Society," 1886. The most important of recent monographs is the excellent one of Dr. Pax, of Breslau (1888), entitled "Monographische Uebersicht über die arten der Gattung Primula."

P. admontensis (Admont). *fl.*, calyx coloured, pubescent; corolla lobes lilac, cordate; scape erect, twice as long as the leaves, few-flowered. May. *l.* spathulate-ovate, dentate-serrate on the margins, glandular-pilose. Roots tufted. Styrian Alps, 1883. A hybrid between *P. Auricula* and *P. Clusiana*, found on limestone rock with its parents. SYNS. *P. Churchillii*, *P. Clusiana dentata.*

Primula—*continued.*

P. alpina (alpine). *fl.* brilliant violet-purple, large, in a many flowered bunch. May. *l.* broadly spathulate or obovate, slightly toothed, covered, as well as the scape, with farina. Grisons. A hybrid between *P. Auricula* and *P. viscosa*, of great beauty, resembling the former in habit and distribution of the flowers. It is suitable for either the rock-garden or the flower-border SYNS. *P. intermedia* (of gardens), *P. rhætica.*

P. amethystina (amethystine). *fl.* red-purple, three to six in an umbel; lobes entire or emarginate. June. *l.* resembling those of a Daisy, ovate-oblong; petioles winged, short, attenuated. Prairies, Yun-nan, China. Plant glabrous, slightly farinose.

P. arctotis (bear's-ear). *fl.* white or lilac-purple, smaller than in *P. pubescens* (to which this plant is closely allied), densely glandular-hairy. *l.* broadly spathulate-obovate, obtuse, toothed, green. 1886. "A pretty hybrid between *P. Auricula* and *P. hirsuta* (Kerner)." (R. G. 1198 B.)

P. Auricula dolomitica (Dolomite). *fl.* of a uniform bright lemon-yellow, having a cylindrical tube and a broadly funnel-shaped limb of obovate, deeply emarginate segments; umbel eight to ten-flowered; scape 2in. to 3in. long, terete, green. *l.* six to eight, broadly oblong, sessile, dull green, minutely hairy, forming a basal rosette, the margins white and minutely ciliated. Tyrol, 1884. A beautiful, alpine species.

P. Balbisii (Baldo). *fl.* shining golden-yellow, large, almost scentless; throat white, hairy. April and May. Baldo, and the Alps of South Tyrol, Styria, &c. This is distinguished from its near ally, *P. Auricula*, by its smaller, rounder, and more glossy leaves, which are entirely free of farina, so conspicuous in this section.

P. bella (pretty). *fl.* violet-purple, two or three on a scape, subsessile, very large. Summer. *l.* long-petioled, ovate or suborbiculate. Habit of the Himalayan *P. uniflora*, but differing in the narrow, deep lobes of the leaves, in the shape of the calyx, and in the corolla, which has bifid lobes, the throat being closed with whitish hairs. Summit of Mount Tsang-Chan, Yun-nan, 1884.

P. bellunensis (Belluno). *fl.* golden-yellow, large, on longish scapes, handsome, free. May and June. *l.* broadly ovate, obtuse; veins prominent; margins deeply and evenly serrated or indented, densely ciliated; petioles winged. Alps of Belluno. Said to be a hybrid between *P. Auricula* and *P. Balbisii.*

P. Berninæ (Bernina). *fl.* rosy-purple, large, very free. April and May. *l.* smaller than in *P. viscosa*, with slightly crenated margins, entirely glandular-hairy, broad-clasping at base. Rocks, rich vegetable soil, Alps, growing with its parents. A natural hybrid between *P. v. hirsuta* and *P. viscosa*, of rare beauty.

P. biflora (two-flowered). *fl.* pretty, deep rose, large, produced in pairs on short scapes, in great abundance. Spring. Tyrol. Habit and appearance of *P. minima*, but with larger leaves, sheathing at base, and distinctly serrated. The whole plant is not more than 1in. or so in height: a lovely little subject for the rockery, exposed. Sandy peat and loam. A hybrid between *P. Flörkeana* and *P. minima.*

P. blattariformis (Blattaria-formed). *fl.* lilac, numerous, scattered; corolla lobes broadly obcordate; raceme 8in. to 12in. long. *l.* ovate or obovate, deeply crenate. Yun-nan. A distinct and handsome species, clothed with short, papilliform hairs.

P. bracteata (bracted). *fl.* yellow, large; lobes obcordate, emarginate; calyx densely pubescent. March. *l.* petioled, rugose-oblong, obtuse, with attenuated base; petioles long, narrowly winged. Rhizome thick and woody, very characteristic. Shaded clefts of the limestone rocks, Lankong, Yun-nan. Related to *P. bullata*, but differing chiefly in the absence of powder, in the shorter pubescence, and in the glandular hairs which cover the entire plant (absent in *P. bullata*).

P. bullata (inflated). *fl.* golden-yellow, large; tube narrow at the throat, but broadening towards the calyx, half as long again as the limb; scapes tall, many-flowered. April. *l.* petiolate, lanceolate, firm, covered underneath with golden dust, reticulated and slightly inflated above; margins doubly dentate or crenate; petioles winged. Rhizome thick, woody, covered with scars above, divided at the base. Calcareous rocks, Yun-nan. A very beautiful species, almost entirely covered with golden farina.

P. calliantha (beautiful-flowered). *fl.* intense violet-purple, five to ten in an umbel, large; calyx campanulate, the teeth narrow, purplish on the outside; bracts lanceolate, acuminate. June. *l.* oblong or obovate-oblong; petioles short, winged and attenuated. Rhizome short and thick. Shady places under Fir-trees on Mount Tsang-Chan, Tali, Yun-nan. A charming species, nearly allied to *P. secundiflora*, differing in its more coriaceous leaves, covered underneath with a fine, golden powder, and finely crenulate instead of serrulate.

P. carniolica (Carniola). *fl.* pale to deep blue, with a silvery-white throat; scape 3in. to 4in. high, with from three to ten flowers. April and May. *l.* 2in. long, ovate-lanceolate, tapering to the base, but again broadening at the clasping point, glabrous, shining on the upper surface. Rosettes large, loose.

Primula—*continued.*

Alps of Carinthia, and Carniola. SYNS. *P. Freyeri*, *P. Jellenkiana*. *P. c. multiceps* has larger and deeper-coloured flowers.

P. cernua (drooping). *l.* broadly ovate, short, petiolate; margins crenulate. Nearly allied to *P. capitata* and *P. erosa*, from which it differs in the flowers (produced in July) being stalked instead of sessile, and in the shape of its leaves and calyx. Chalky, alpine pastures north of Tali, Yun-nan, 1883.

P. Churchillii (Churchill's). A synonym of *P. admontensis*.

P. ciliata (ciliated). A variety of *P. viscosa*.

P. Clusiana dentata (toothed). A synonym of *P. admontensis*.

P. commutata (changed). A variety of *P. viscosa*.

P. confinis (neighbour). A variety of *P. viscosa*.

P. cridalensis (Cridala). *fl.* rosy-purple, large. *l.* ovate, broadening again at base, slightly ciliated, and rough on the upper surface. Tyrol, 1884. A very distinct hybrid between *P. tyrolensis* and *P. Wulfeniana*. It is a fine plant for exposed rockeries.

P. daonensis (Val Daone). *fl.* pale rose, with a white centre, very large. May and June. *l.* obovate, glandular-hairy on both sides; margins serrated. Tyrol and Eastern Swiss Alps (6500ft. to 9800ft.), 1854. A small and very pretty plant; it does well on exposed places on rockery. SYN. *P. œnensis*.

P. decora (comely), of Sims. A form of *P. viscosa hirsuta*.

P. Delavayii (Delavay's). *fl.* intense purple, large, slightly hairy on the outside; peduncles eventually 1ft. or more high. August. *l.* broadly ovate or sub-orbicular, cordate. Damp situations in clayey soil (16,000ft.), Yun-nan, China. A very interesting new species, constituting a new sub-genus on account of the large, laterally compressed seeds, and by the flowers appearing before the leaves, borne singly on bractless peduncles.

P. denticulata alba (white). A white-flowered variety, requiring the same treatment as the type. 1886.

P. digenea (two-natured, *i.e.*, hybrid). A hybrid between *P. elatior* and *P. vulgaris*, nearly allied to the former. It is not distinct enough for general collections. Alps.

P. Dinyana (Dinyan's). *fl.* deep purple, handsome, produced in great abundance; corolla lobes narrow-obcordate; scapes 3in. to 6in. high, disposed in rather large heads of four to ten flowers. Spring. *l.* 4in. long, ovate-lanceolate, with ciliated and slightly dentate margins. Bavaria. A hybrid between *P. integrifolia* and *P. viscosa*, most nearly allied, however, to the first parent, from which it takes its habit. It is a very useful plant for the rockery, doing best in rather shady nooks, in rich, vegetable soil.

P. discolor (two-coloured). *fl.* lilac or violet-purple, with silvery eye, large; scape 3in. to 4in. high, covered with farina. April. *l.* ovate, with dentate margins, sparingly covered with glandular hairs. Western and South Tyrolese Alps (in fissures of granite rocks, 6000ft. to 7000ft.). A hybrid between *P. Auricula* and *P. daonensis*, resembling the former in habit. It is a charming plant, easily managed in the open border. A possible parent of the garden Auriculas.

P. dolomitica (Dolomite). A variety of *P. Auricula*.

P. dryadifolia (Dryas-leaved). *fl.* violet, three to five in an umbel, sub-sessile; calyx campanulate; bracts broadly ovate. July. *l.* ovate or sub-cordate; petioles short, winged. Rhizome long, slender. Glacier of Li-Kiang, Yun-nan. Habit much resembling that of *Dryas octopetala*, well characterised by its leaves and the shape of its bracts.

P. Dumoulinii (Dumoulin's). *fl.* deep rose-coloured, large for the size of the plant; corolla lobes obcordate; scapes not more than 2in. high, producing numerous flowers, in compact bunches. Spring. *l.* more spreading, larger, and broader than in *P. minima* (which this plant resembles in habit), with numerous small pits on the upper surface. Collected on the Mountain Trate, Indicarien, Austria, 1877. A robust-growing, free-flowering hybrid between *P. minima* and *P. spectabilis*, with the characters of both parents distinctly shown in robust specimens. It is pretty for rockeries, doing well wherever *P. minima* grows. Sandy peat, in rather dry positions.

P. elatior calycantha (calyx-flowered). A pretty, garden form, having a large, leafy, frilled and lobed calyx, which is coloured like the corolla. 1886. (R. G. 1886, p. 242, f. 17.)

P. e. intricata (perplexing). A very distinct, Continental form of our wild Oxlip, but not worth adding to general collections.

P. elliptica (elliptic). *fl.* four to twelve in a loose umbel, violet or bluish-purple, with broad, deeply-cleft lobes; tube variable in length. June and July. *l.* not mealy, 2in. long, ovate or ovate-oblong, narrowed into a broad petiole, with sharply-toothed margins, dark green and shiny above. *h.* 6in. to 12in. Near Thibet, Cashmere, &c. (8000ft. to 12,000ft.). Habit of *P. rosea*.

P. Elwesiana (Elwes'). *fl.* dark purple, solitary, very large; calyx five-parted, the segments ovate-lanceolate; scape 6in. to 7in. high. *l.* 2in. to 3in. long, oblanceolate, acute, entire; petioles broadly winged. Rootstock stout, with broad, fleshy, leafy scales. Sikkim-Himalaya. A remarkable and beautiful species. (G. C. n. s., xxi., p. 645.)

P. Escheri (Escher's). *fl.* rose or lilac-purple, large; scapes 2in. to 3in. high, bearing several flowers. April. *l.* 1in. to 2in. long, half as broad, ovate-lanceolate, the margins cartilaginous, serrated. 1880. Whole plant glandular-hairy. Habit of *P. integrifolia*, in close, dense, tufty rosettes of numerous leaves. A hybrid between *P. Auricula* and *P. integrifolia*, growing with its parents.

P. Facchinii (Facchin's). *fl.* rosy-purple, rather large, two or three to each scape. May and June. *l.* spathulate, gracefully curved, and usually deeply crenated at apex, bright green; rosettes compact. Granite region, Southern Tyrol. An extremely graceful and useful plant, hybrid between *P. minima* and *P. spectabilis*, most nearly allied to *P. minima*. It is the easiest to manage of the newer hybrids, and a profuse blossomer.

P. farinosa *var.* (of Scopoli). A synonym of *P. longiflora*.

P. Flörkeana (Flörke's). *fl.* deep lilac or lilac-purple; corolla lobes obovate, deeply bifid; scape 2in. high, bearing several flowers, surrounded by a leafy involucre. Spring. *l.* cuneate or tongue-shaped, broad at the apex, dentate or serrated, about 1in. long. Growing with its parents on the Swiss and Tyrolean granite Alps (7000ft.). A charming little hybrid between *P. glutinosa* and *P. minima*; very free and vigorous. SYN. *P. minima hybrida*.

P. Forsteri (Forster's). *fl.* deep rose-coloured, with white throat, large, produced two or three on each scape, and usually twice in the year—early spring and autumn—rarely failing. *l.* three to four times larger than in *P. minima*, deeply and sharply serrated at apex, hairy on the margins and upper surface. Padaster, in Gschnitz Valley, Central Tyrol, 1880. A hybrid between *P. minima* and *P. viscosa hirsuta*. Habit and leaves resembling *P. minima*, but very robust, and having the hairs of the latter parent.

P. Freyeri (Freyer's). A synonym of *P. carniolica*.

P. Gambeliana (Gambel's). *fl.* purple, the mouth annulate; corolla lobes round, emarginate; scape few-flowered. *l.* 1in. in diameter, orbicular-cordate, toothed, glabrous. Buds mealy. Temperate Himalayas. Similar to *P. rotundifolia*, but with fewer and larger flowers. (G. C. n. s., xxi., p. 545.)

P. geraniifolia (Geranium-leaved). *fl.* many, in a solitary, terminal umbel, with sometimes a whorl below the umbel, spreading and drooping; corolla pale purple, glabrous, the tube a little longer than the pubescent calyx, rather inflated and contracted at the yellow, annulate mouth; scape erect, 6in. to 10in. long, softly hairy. May. *l.* spreading, 1in. to 1½in. in diameter, orbicular and deeply cordate, pale yellow-green, membranous, hirsute on both surfaces, eleven to fourteen-lobulate. Rootstock short. Eastern Himalaya, 1837. (B. M. 6984.)

P. glacialis (glacial). *fl.* violet, three to five in an umbel. June. A charming little species, distinguished by its long calyx, divided four-fifths of its entire length into very narrow lobes, and by its corolla, with narrow, quite entire divisions. Nearest *P. nivalis* (of Pallas, not of gardens) and *P. Fedschenkoi*. It differs in its larger, more deeply-lobed calyx. Clefts of rocks on the Glacier of Li-Kiang, Yun-nan, China.

P. Heerii (Heer's). *fl.* purple, large, several on a scape. April. Habit low, close, and tufty, like that of *P. integrifolia*, from which the leaves differ in being 1in. to 2in. long, ovate-lanceolate, slightly toothed, and hairy. A hybrid between *P. viscosa hirsuta* and *P. integrifolia*, growing with its parents.

P. hirsuta (hairy). A variety of *P. viscosa*.

P. Hugueninii (Hugueninn's). *fl.* fine, deep purple, large; scape 2in. to 3in. high, bearing several flowers. April and May. *l.* 1in. long, obovate- or ovate-lanceolate, toothed from the middle of the blade to the apex; margins covered with short hairs, slightly glutinous. 1880. Habit tufty, like that of *P. integrifolia*; rosettes close and large. A hybrid between *P. glutinosa* and *P. integrifolia*, growing with its parents.

P. humilis (dwarf). A synonym of *P. pusilla*, of Wallich.

P. Huteri (Huter's). *fl.* deep violet; limb shorter than the tube; scape glutinous, with three or four oblong bracts. May. *l.* long-spathulate, with eleven to fifteen short, broad, triangular teeth, thickened at the tips like small bladders. Tyrol, &c. A pretty little hybrid between *P. Flörkeana* and *P. glutinosa*; habit of the latter, not more than 1in. high.

P. intermedia (intermediate). A garden synonym of *P. alpina*.

P. Jæschkiana (Jæschke's), of Kerner. A synonym of *P. Stuartii purpurea*.

P. Jellenkiana (Jellenk's). A synonym of *P. carniolica*.

P. Kerneri (Kerner's). *fl.* of a reddish-violet colour, with a yellowish-white throat; calyx campanulate; teeth twice as long as broad, elliptic, and pointed; scapes stout, 2in. to 4in. high, bearing several flowers. April and May. *l.* bright green, slender, broadly spathulate-obovate, dentate-serrate. Styria and Eisenhut, near Turrach, in Stieirmark, in company with *P. Göbtii*. Habit of *P. viscosa*, the entire plant covered with black, glandular hairs. A hybrid between *P. Auricula* and *P. villosa*.

P. Kitaibeliana (Kitaibel's). A variety of *P. spectabilis*.

P. latifolia (broad-leaved). *See* **P. viscosa latifolia**, on p. 223, Vol. III.

P. Lebliana (Leblian's). *fl.* rose-purple, large and fine; scape 3in. to 4in. high, three to eight-flowered. April and May

Primula—*continued.*

l. ovate-lanceolate, 1in. to 2in. long, in close rosettes; upper surface glabrous, shiny; margins cartilaginous, dentately serrated. 1880. Habit of *P. Wulfeniana*, which it most nearly resembles, although the traces of the other parent are most distinct both in leaves and flowers. A hybrid between *P. Auricula* and *P. Wulfeniana*, growing with its parents.

P. longiflora (long-flowered). *fl.* brilliant violet or purple, over ½in. in diameter, enveloped in farina; tube three times longer than the calyx divisions, the latter triangular, pointed; scapes 1ft. to 1½ft. high, stout, the bracts surrounding the umbel larger and broader than in *P. farinosa*. May and June. *l.* only slightly farinose underneath, 1in. to 2in. long, ovate-oblong, pointed, irregularly notched or toothed, slightly dilated at base. Grassy regions of the high Alps (5000ft. to 7000ft.). Somewhat resembling *P. farinosa* in habit and general appearance. SYN. *P. farinosa* var. (of Scopoli). *P. l. Krattli* is said to be a hybrid between *P. farinosa* and *P. longiflora*, found in 1876.

P. longobarda (Lombard). *fl.* rose-purple, large, several on a scape; calyx campanulate; teeth short and obtuse. April. *l.* not glutinous, obovate-lanceolate, acute, hardly punctured. Calcareous and granite regions, South Tyrol, Lombardy. A very distinct plant, nearest to *P. calycina*, of which it may turn out to be a variety; habit much the same.

P. magiassonica (Mount Magiassone). *fl.* large, like those of *P. spectabilis*. May. *l* ovate or obovate, 1in. long and about as broad, glabrous; upper surface closely pitted; margins cartilaginous, slightly serrated. 1880. Habit and disposition of *P. spectabilis;* rosettes close, tufty. A hybrid between *P. spectabilis* and *P. minima*, growing with its parents.

P. minima hybrida (hybrid). A synonym of *P. Flörkeana.*

P. m. pubescens (downy), of Josch. A synonym of *P. Sturii.*

P. minutissima (very minute). *fl.* bright purple, ¼in. to ½in. in diameter (large for the size of the plant); lobes bifid; scape hardly rising above the leaves, bearing one to three flowers. June. *l.* densely crowded, dark green, oblanceolate, acute or obtuse, toothed, mealy beneath. Alpine Himalaya. A pretty little species, forming large patches of rosettes, each ½in. to 1in. in diameter.

P. multiceps (many-headed). A variety of *P. carniolica.*

P. Muretі (Muret's). A synonym of *P. Muretiana.*

P. Muretiana (Muret's). *fl.* rich, deep purple, many in a head, large, opening earlier than those of *P. integrifolia.* April and May. *l.* broader than in *P. Dinyana*, entire or slightly toothed, viscous-hairy. High Alps. Closely allied to *P. Dinyana*, and also a hybrid between *P. integrifolia* and *P. viscosa*, taking more after the latter than the former parent. Rich, deep loam, in a cool position. SYN. *P. Mureti.*

P. muscoides (Moss-like). *fl.* purplish, small, solitary; corolla segments deeply two-lobed. *l.* sessile, obovate, oblong, or subspathulate, dilated at the base; margins coarsely toothed. Sikkim-Himalaya. Plant densely tufted, small, not mealy. (G. C. n. s., xxi., p. 545.)

P. m. tenuiloba (slender-lobed). *fl.*, corolla tube narrower, slightly hairy; lobes very narrow, deeply cleft, with narrow lobules.

P. Nelsoni (Nelson's). A variety of *P. viscosa.*

P. nivalis (snowy), of gardens. A synonym of *P. pubescens alba.*

P. nivalis (snowy), of Pallas. *fl.* lilac-purple; calyx tube oblong or broadly lanceolate, shorter than the oblong capsule; corolla lobes oblong or oval, entire, three to four lines long, the tube funnel-formed; umbels consisting of two to ten flowers on scapes 3in. to 18in. high. Spring. *l.* 1in. to 6in. long, thickish, perfectly glabrous and often mealy on the under surface; margins often entire, but usually closely denticulate. Caucasus, &c., 1790. (R. H. 1878, p. 12.) The description of *P. nivalis* given on p. 221, Vol. III., is that of *P. pubescens alba* (SYNS. *P. nivalis* and *P. nivea*, of gardens), and should be replaced by the above.

P. nivea (snowy), of gardens. A synonym of *P. pubescens alba.*

P. obovata (obovate). *fl.* pale rose or purple, several on a stout scape. April and May. *l.* 1in. long, ovate, obtuse, glandular-hairy above; margins evenly and distinctly serrated, glandular-hairy. Valmenon. A hybrid between *P. tyrolensis* (of which it is a near ally) and *P. Balbisii*, growing with its parents.

P. Obristii (Obrist's). A hybrid between *P. Balbisii* and *P. Auricula;* very near the former, but more robust.

P. obtusifolia (obtuse-leaved). *fl.*, calyx dark brown when not mealy, campanulate; corolla claret or almost port-wine coloured, rarely yellow, the mouth orange-yellow, the lobes broadly obcordate; scape 6in. to 10in. high. May and June. *l.* variable, 2in. to 5in. long, usually obtuse, the under surface naked or mealy. Himalayas, 1887. (B. M. 6956.)

P. œnensis (a mistake for Val Daone). A synonym of *P. daonensis.*

P. Olgæ (Olga's). *fl.* pretty rosy-lilac or purple, resembling those of *P. sibirica;* corolla lobes obcordate, bifid; scape 3in. to 4in. high, terminating in a few-flowered umbel. Spring. *l.* ovate-oblong, tapering to a narrow, winged petiole, glabrous, shiny on both sides. Turkestan, 1887. Said to be nearly allied to *P. nivalis* (of Pallas), and a great acquisition.

Primula—*continued.*

P. pallida (pale). A very slight form of *P. viscosa hirsuta.*

P. pedemontana (Piedmont). *See* **P. viscosa pedemontana,** on p. 223, Vol. III.

P. Peyritschii (Peyritsch's). A hybrid between *P. Auricula* and *P. viscosa.* It may be treated as a very robust form of the latter species. Alps. SYN. *P. viscosa major* (of English gardens).

P. pinnatifida (pinnatifid). *fl.* violet; tube long, cylindrical; lobes entire. July. *l.* long-petiolate, winged, ovate or oblong, the base entire, cuneate, pinnatifid. Glacier of Li-Kiang, Yun-nan, China. The flowers of this species recall those of *Erinus alpinus*, but are, of course, larger.

P. Plantæ (Planta's). *fl.* rose-purple, rather large. April and May. *l.* ovate, pointed, finely serrated from the middle to the apex, entirely covered with brown, glandular hairs. 1880. Habit robust, like that of *P. viscosa hirsuta;* rosettes close and tufty. A hybrid between *P. viscosa hirsuta* and *P. daonensis*, growing with its parents.

P. Portæ (Porta's). *fl.* wine-red, large, several on a scape. April and May. *l.* small, viscous, obovate, serrated only on the upper half. South Tyrol, 1873. A hybrid between *P. Auricula* and *P. daonensis.* It is allied to *P. discolor*, but differs in the glandular-hairy scape and in the absence of farina on the calyx and corolla. A useful little plant for rockeries.

P. pubescens alba (white). *See* description under **P. nivalis,** on p. 221, Vol. III. This plant has been long known in English gardens under the names of *P. nivalis* and *P. nivea*, and has been supposed to be a variety of *P. viscosa.* It is, however, not viscid, and is usually mealy, which not only excludes it from *P. viscosa*, but also from *P. v. hirsuta*, under which it is often quoted.

P. pulchra (beautiful). *fl.* purple, large for the size of the plant (1in. in diameter); tube funnel-shaped. *l.* oblong or ovate-oblong, glaucous beneath; base round or cordate; margins wavy. Sikkim-Himalaya. Plant glabrous, not mealy. (G. C. n. s., xxi., p. 545.)

P. pumila (dwarf). *fl.* rosy-purple, large, free; calyx tubular-campanulate, the teeth ovate; scape about 1in. high, glandular-hairy, two or more-flowered. April and May. *l.* cuneate, ¼in. to ½in. long, half as broad, with seven to nine large, triangular teeth at the apex; margins covered with small, sessile glands. Southern Tyrol, &c. (6000ft. to 7000ft.). This hybrid between *P. minima* and *P. daonensis* is well named, being amongst the smallest of its class. It is nearly allied to *P. minima* in habit and general appearance.

P. purpurea (purple), of Royle. A variety of *P. Stuartii.*

P. pusilla (weak), of Wallich. *fl.* violet-purple, sessile, about 1in. in diameter; calyx hoary; tube short, terete; lobes oblong, obtuse or acute; scape slender, one to four-flowered. Spring. *l.* ½in. to 1in. long, spathulate-oblanceolate, pinnatifidly toothed. Central and Eastern Himalayas (13,000ft. to 16,000ft.). Plant densely tufted, hoary. This must not be confounded with *P. pusilla*, of Goldie. SYN. *P. humilis.*

P. Reidii (Reid's). *fl.* ivory-white, fragrant, very shortly pedicellate, nodding; calyx ample, glandular-ciliate; corolla tube as long as the calyx, the lobes broadly oblong, connivent in a globe, bilobed at apex; scape rigid, many-flowered. May. *l.* oblong or oblong-oblanceolate, deeply lobulate-toothed or -crenate, narrowed into the petioles, bullate, loosely silky-villous. Sikkim-Himalaya, 1886. (B. M. 6961; G. C. n. s., xxvi., p. 691.)

P. reticulata (netted). *fl.* yellow; corolla tube funnel-shaped, the much-exserted mouth not annulate; scape 6in. to 12in. high. Late spring. *l.* oblong-cordate, obtuse, doubly crenate, reticulated, glaucous beneath, on long petioles. Central and Eastern Himalayas (11,000ft. to 15,000ft.), 1887. Plant glabrous, mealy or not. A close ally of *P. sikkimensis.*

P. rhætica (Rhetian Alps). A synonym of *P. alpina.*

P. rotundifolia (round-leaved). *fl.* pale purple or pink, with a yellow throat; corolla tube twice as long as the calyx; limb flat, 1in. in diameter; inflorescence puberulous and mealy; scape 8in. to 12in. high. June. *l.* 1in. to 4in. in diameter, orbicular-cordate, crenately toothed; petioles 6in. to 12in. long. Buds in resting season densely covered with sulphurous meal. Temperate Himalayas (12,000ft. to 14,000ft.).

P. Rusbyi (Rusby's). *fl.* deep purple, with a yellow eye; calyx mealy-white at base, the meal running up between the lobes in acute, tooth-like patches; corolla lobes obcordate; umbels six to ten-flowered; scapes 5in. to 10in. high. Spring. *l.* oblong-spathulate, denticulate. New Mexico, 1881. A distinct species.

P. salisburgensis (Salzburg). *fl.* reddish-purple, rather large, several in a head; bracts oblong, as broad as the calyx teeth; scape not viscous. April and May. *l.* cuneate, the upper quarter of their margins set with seven to nine acute, triangular teeth, the tips blunt. A hybrid between *P. glutinosa* (which it resembles in habit) and *P. minima*, growing with its parents. It should be grown in peaty soil, sphagnum, &c.

P. secundiflora (side-flowering). *fl.*, calyx purplish, the lobes deltoid, lanceolate, acute; corolla intense violet, the tube cylindrical, the lobes broadly obovate, entire. July. *l.* papery, covered with golden dust, oblong or ovate-oblong; margins

Primula—*continued.*

equally serrulate; petioles broadly winged, attenuated. Glacier of Li-Kiang, Yun-nan, China. Plant glabrous, allied to *P. sikkimensis*. It is one of the most beautiful of the Primulas.

P. septemloba (seven-lobed). *fl.*, calyx campanulate, glabrous or nearly so, divided to the middle into equal, lanceolate, acute divisions; corolla purple, 1in. long, the limb concave, the lobes obovate, emarginate. July. *l.* nearly round, deeply cordate at base, deeply seven-lobed; lobes broadly ovate, obtuse. Rhizome slender, horizontal. Forests at the base of the Glacier Li-Kiang, Yun-nan, China. Entire plant covered with soft, pliant, jointed hairs. Nearly allied to *P. mollis*.

P. serratifolia (serrate-leaved). *fl.* golden-yellow, five to ten in an umbel, large; scapes longer than the leaves. June. *l.* thin, papery, oblong or obovate towards the long and winged petioles; margins acutely denticulate or erose. Prairies, Yun-nan. This is a near ally of *P. obtusifolia*, entirely glabrous, and without meal. It must not be confounded with the obscure European *P. serratifolia*, a hybrid between *P. minima* and *P. Wulfeniana*.

P. similis (like). A hybrid between *P. Balbisii* and *P. Auricula*, apparently about intermediate between them. It is a fine, robust plant for the rockery or flower-border. April and May. Indicarien and Petrasch, Styria.

P. soldanelloides (Soldanella-like). *fl.* white, large, nodding; scape one-flowered; corolla lobes obcordate. *l.* ½in. to ¾in. long, petioled, ovate, runcinate-pinnatifid. Sikkim-Himalaya. Plant quite glabrous, not mealy. (G. C. n. s., xxi., p. 545.)

P. sonchifolia (Sonchus-leaved). *fl.* violet. June. *l.* glabrous, oblong or obovate-oblong, obtuse, attenuated, sinuate, resembling those of *Sonchus asper*; petioles broadly winged. Slopes of the mountain Tsang-Chan, China. Nearly allied to *P. obtusifolia*, but distinguished by its almost runcinate leaves.

P. spectabilis Kitaibeliana (Kitaibel's). *fl.* rosy-purple, larger than in the type, several on each scape, produced in abundance. April and May. *l.* ovate, pointed, serrated, densely covered with short, white hairs. Sub-alpine stations in Croatia. Habit of *P. spectabilis*. A charming plant for the rock-garden, on sunny, exposed places. It requires rich, vegetable soil.

P. spicata (spiked). *fl.* violet, spicate, resembling those of *P. uniflora*. June. *l.* papery, pale green, ovate or ovate-oblong, obtuse, attenuated at base, doubly crenate; petioles narrowly winged. Elevated pastures of Tsang-Chan, above Tali, Yun-nan, 1884. A very remarkable species, with unilateral, spicate flowers, a form of inflorescence unique amongst Primulas.

P. Steinii (Stein's). *fl.* violet-purple, with a white throat, large; scape 1in. to 2in. high, three or four-flowered. April. *l.* in large rosettes, obovate-spathulate, with seven to nine large teeth at apex, and having thinly-scattered, glandular hairs along their margins. Central Tyrolean Alps, 1878. A hybrid between *P. minima* and *P. viscosa hirsuta*, resembling the former in habit. It is a splendid plant for the rock-garden, producing flowers in the greatest profusion, and as robust as in *P. Forsteri*.

P. Stuartii purpurea (purple). *fl.* pale or deep purple, often in two whorls; lobes obcordate or bifid, entire. Summer. *l.* rarely toothed, broad, white or yellow beneath. Sub-alpine and Alpine Himalayas. Habit and leaves resembling *P. Stuartii*. SYN. *P. Jæschkiana* (of Kerner).

P. Sturii (Stur's). *fl.* rose-purple, large and free. April and May. *l.* about 1in. long, wedge-shaped, glandular-hairy, coarsely toothed at the almost truncate apex. Steiermark, near Eisenhut, 1856. A hybrid between *P. minima* and *P. viscosa*, with the habit and general appearance of the former, but freer and more robust. SYN. *P. minima pubescens* (of Josch).

P. tenella (tender). *fl.* bluish-white, large, solitary, erect; corolla lobes obcordate. *l.* numerous, mealy all over, cuneate and entire below the middle, toothed above. Eastern Thibet. Whole plant 2in. to 2½in. high, glabrous. (G. C. n. s., xxi., p. 545.)

P. tenuiloba (slender-lobed). A variety of *P. muscoides*.

P. uniflora (one-flowered). *fl.* pale lilac, larger than the whole rosette of leaves; corolla lobes shallow, unequally toothed; scape slender, one or two-flowered. *l.* few, ½in. long, orbicular or broadly ovate, pinnatifidly crenate. Sikkim-Himalaya. A charming little species. (G. C. n. s., xxi., p. 545.)

P. Venzoi (Venzo's). *fl.* pale purple, one to three to a scape, 1in. in diameter, very pretty; petals deeply cut. April. *l.* 1in. to 1½in. long, ovate-lanceolate, pointed; margins rough, cartilaginous, slightly indented; surface hairy and densely pitted. Tyrol, &c. Habit tufty, in dense rosettes. A hybrid between *P. tyrolensis* and *P. Wulfeniana*, nearly allied to the latter.

P. vincifiora (Periwinkle-flowered). *fl.* purplish-violet, 1½in. in diameter; tube long, pubescent, swollen at the base; corolla lobes obcordate; scape hairy, one-flowered. *l.* cuneate-oblong, ciliated, covered with reddish, sessile glands. Yun-nan, China. (G. C. ser. iii., vol. i., p. 575, f. 108.)

P. viscosa ciliata (fringed). A very robust form, with larger flowers, produced in greater abundance than in the type.

P. v. commutata (changed). *fl.* bright rose, large. May and June. *l.* broadly ovate or obovate, viscous-hairy; margins entire or slightly toothed. Porphyritic region, Eastern Alps.

P. v. confinis (neighbour). *fl.* bright, deep rose, large, very handsome, approaching those of *P. v. ciliata*, but larger and more vigorous. May and June. *l.* small, obovate, toothed, viscous-hairy. Alps.

P. Primula—*continued.*

P. v. hirsuta (hairy). *fl.* pale lilac, with a bright silvery eye, large. Spring. Eastern Switzerland, Tyrol, &c. (6000ft. to 7000ft.). A charming variety, forming large rosettes of ovate or obovate leaves, deeply and sharply toothed, and densely covered with soft hairs. *P. decora*, of Sims (B. M. 1922), is very nearly allied to this variety, as also is *P. pallida*.

P. v. major (larger). A garden synonym of *P. Peyritschii*.

P. v. Nelsoni (Nelson's). *fl.* pale purple or pink, many on a scape. April and May. *l.* obovate, entire or slightly serrated; margins glandular-hairy. Habit of *P. viscosa*; rosettes neat. Originated in English gardens.

P. Wulfeniana (Wulfen's). *fl.* deep purple-violet, large. April and May. *l.* not punctate as in *P. spectabilis*, lanceolate-spathulate, shiny green; margins rough, cartilaginous. Alps. A good and very free rockery plant, requiring calcareous soil. In Vol. III., p. 222, it is placed as a variety of *P. spectabilis*, but it is quite entitled to specific distinction.

P. yunnanensis (Yun-nan). *fl.* violet-purple; corolla tube narrow, twice as long as the calyx; limb concave, bilobed, the lobes ovate, entire. July. *l.* ovate-oblong, crenulate, mucronate; petioles short, narrowly winged, glabrous. Clefts of limestone rocks at foot of Li-Kiang Glacier, China. A very fine species, closely allied to *P. uniflora*.

PRIONOPHYLLUM. A synonym of **Encholirion** (which *see*).

PRITCHARDIA. To the species described on p. 224, Vol. III., the following should now be added:

P. Thurstoni (Thurston's). *fl.* borne in compact panicles at the apices of the slender stems; stems longer than the leaves, from the axils of which they rise. *l.* fan-shaped, palmatisect, large, forming a dense tuft at the top of the tall stem. Fiji. (R. G. 1887, p. 486-9, f. 123-4, 1-3.)

PRUNUS. Bentham and Hooker include *Cerasus* under this genus. To the species and varieties described on pp. 235-7, Vol. III., the following should now be added:

P. domestica Plantierii (Plantier's). *fl.* pure white, semi-double, produced in abundance, and succeeded by black Plums of good flavour. 1885. Garden variety.

P. hybrida reptans (hybrid, creeping). *fl.* red. Branches prostrate, divaricate. 1886. Garden hybrid. (R. H. 1885, pp. 416-7.)

P. h. stricta (erect). *fl.* white. Branches erect. 1886. Garden hybrid. (R. G. 1886, pp. 416-7.)

P. Jacquemontii (Jacquemont's). *fl.* often in pairs, very shortly pedicellate; calyx tube ¼in. to ½in. long; petals pink, ¼in. broad, orbicular; stamens about twenty. May. *l.* 2in. to 2½in. long, ovate, ovate-lanceolate, elliptic, or nearly obovate, acute or acuminate, serrulate; petioles ¼in. long. *h.* 6ft. to 10ft. North-west Himalayas, 1836. Hardy shrub. (B. M. 6976.)

P. japonica (Japanese). The correct botanical name of the plant described on p. 236, Vol. III., as *P. sinensis*.

P. j. sphærica (spherical). This form only differs from the type in its somewhat larger, spherical fruits. (R. H. 1887, p. 136, f. 29.)

P. Mume Alphandi (Alphand's). A variety having semi-double, rose-pink flowers. Japan, 1885. (R. H. 1885, p. 564.) SYN. *Armeniaca Mume Alphandi*.

PSEUDOPHŒNIX (from *pseudos*, false, and *Phœnix*; alluding to the resemblance in general aspect to the kindred genus *Phœnix*). ORD. *Palmæ*. A monotypic genus. The species is a stove Palm, requiring similar culture to **Phœnix** (which *see*, on pp. 103-4, Vol. III.).

P. Sargenti (Sargent's). *fl.*, spadix panicled, about 3ft. long and broad. *fr.* bright orange or red, ¾in. in diameter. *l.* pinnate, 4½ft. long; leaflets lanceolate, acuminate, 1ft. to 1½ft. long, glaucous beneath. *h.* 25ft. Florida, 1887. (G. C. ser. iii., vol. iv., p. 409; G. & F., vol. i., 1888, pp. 353, 355.)

PSITTACOSCHŒNUS. A synonym of **Gahnia** (which *see*).

PSYCHOTRIA. To the species described on p. 239, Vol. III., the following should now be added:

P. sulphurea (sulphur-coloured). *fl.* bright blue, Centranthus-like, borne in clusters. *fr.* sulphur-yellow. *l.* shining green. Fiji, 1887. A profuse and continuous flowering, small, climbing shrub.

PTERIS. To the species and varieties described on pp. 240-5, Vol. III., the following should now be added:

P. Bausei (Bause's). *sti.* deep chestnut-brown. *fronds* densely tufted, erect, 12in. to 13in. high; pinnæ about 2in. long, the lowermost bipinnate, consisting of four to six broadly linear, deep green pinnules. 1886. A useful, decorative, garden Fern, of very compact habit.

Pteris—*continued.*

P. longifolia nobilis (noble). *fronds* evergreen, 4ft. to 5ft. high; pinnæ linear, 8in. to 10in. long; rachis pale brown. *sori* continuous, linear, marginal. South Sea Islands, 1884.

P. serrulata cristata lacerata (torn). *fronds* 9in. to 12in. long, slender, the margins serrulate; each pinna divided into a tassel-like or corymbose, drooping bunch of lacerated segments. 1882. *nana* is a dwarf form.

P. tremula foliosa (leafy). *fronds* wavy, larger and broader than in the type. 1886. Garden variety.

P. t. grandiceps (large-crested). *fronds* semi-dependent, the apices divided into flattish, fimbriately-tasselled crests, made up of four or five principal divisions and numerous multifurcations; pinnæ and pinnules also terminating in narrow apices. 1887. Garden origin.

PTYCHOCOCCUS (from *ptyche*, a fold, and *coccos*, a berry; in allusion to the wrinkled albumen). ORD. *Palmæ*. A genus of three species of Javan Palms, founded by Beccari, formerly included under *Ptychosperma*. It differs from that genus in the form of the fruit, which in *Ptychococcus* is obliquely attenuated into a beak at the apex, instead of being rounded. For culture, *see* **Ptychosperma,** on p. 247, Vol. III.

P. arecinus (Areca-like). A very beautiful, pinnate-leaved Palm, which, in its native forests, attains a height of 60ft. or more.

PULTENÆA. To the species described on pp. 251-2, Vol. III., the following should now be added:

P. Gunni (Gunn's). *fl.* golden-yellow, with brownish-purple stripes on the standard and a brownish-purple keel, small; heads three to five-flowered, terminating the branchlets. *l.* very small, linear-lanceolate. Branches twiggy. 1885. (R. G. 1173 [1174 in text].)

PUYA. To the two species described on p. 255, Vol. III., the following should now be added:

P. lanuginosa (woolly). *fl.* greenish-blue, borne in a dense, simple spike 1ft. long by 3in. in diameter, surmounting a stout peduncle 3ft. long; flower bracts lanceolate, acuminate, very woolly, whitish-brown on the back; sepals obtuse, much imbricated; petals oblong-obovate, the blade ⅔in. broad. *l.* sixty to 100 in a dense rosette, ensiform, 2ft. to 2½ft. long, 1in. broad low down, tapering to a long point, green above, white below, beset with distant, ascending spines. Trunk 2ft. to 3ft. high, forked at the top, hidden by old, dead, reflexed leaves. This plant flowered for the first time at Kew in October, 1888.

P. Roëzli (Roëzl's), of E. Morren. *fl.* sub-sessile; calyx pale rose, downy; corolla peacock-blue, tubular, 1⅓in. long; panicle 2½ft. high, downy. *l.* numerous, thick, coriaceous, arching, 2ft. to 2½ft. long, 2in. to 2½in. broad, shining green above, covered with white felt beneath, the margins spiny. Andes of Peru, 1885. The correct name of this plant is *Pitcairnia megastachya* (Baker).

PYRETHRUM. To the species and varieties described on p. 257, Vol. III., the following should now be added:

P. Decaisneanum (Decaisne's). A synonym of *Chrysanthemum Decaisneanum*.

P. marginatum (margined). A synonym of *Chrysanthemum marginatum*.

P. parthenifolium aureum selaginoides (Selaginella-like). *l.* flat, shallowly lobed, so cut as to resemble a sprig of Selaginella, of a bright yellowish-green. 1882.

PYRUS. To the species and varieties described on pp. 258-62, Vol. III., the following should now be added:

P. Aucuparia foliis-aureis (golden-leaved). *l.*, leaflets rather thick, tomentose, marked with yellow, which deepens with age. 1886. An ornamental, garden variety.

QUERCUS. To the species and varieties described on pp. 263-6, Vol. III., the following should now be added:

Q. sessiliflora pendula (hanging). A variety with pendulous branches.

RANUNCULUS. To the species described on pp. 273-5, Vol. III., the following should now be added:

R. Seguieri (Seguier's). *fl.* white, ¾in. in diameter; petals five, entire, orbicular, longer than the calyx. June and July. *l.* three-parted, with acute or bluntish, entire, trifid partitions; floral ones small, sessile, entire or trifid. Stem one to three-flowered. *h.* 3in. Alps, 1819. (R. G. 1192, f. 1 [1194, f. 1, in text].

RAPHANUS. To the species described on p. 276, Vol. III., the following should now be added:

R. isatoides (Isatis-like). *fl.* yellow, in racemes terminating the side branches. *l.*, radical ones lyrate-pinnatisect; cauline ones ovate-lanceolate, amplexicaul, thick, glaucous. 1886. A garden variety of Radish, with the general aspect of *Isatis tinctoria*. (R. H. 1876, p. 372, f. 101.)

REICHARDIA (of Roth). A synonym of **Picridium** (which *see*).

RENANTHERA ARACHNITES. A synonym of **Arachnanthe moschifera** (which *see*).

RENANTHERA FLOS-AËRIS. A synonym of **Arachnanthe moschifera** (which *see*).

RESTREPIA. To the species described on p. 284, Vol. III., the following should now be added:

R. pandurata (fiddle-shaped). *fl.*, lip pandurate, the anterior blade very broad, transversely oblong, covered with warts, hairy, whitish, with numerous port-wine-coloured spots; column having two orange spots at the base. September. *l.* as much as 4in. long. 1884.

RETTBERGIA. A synonym of **Chusquea** (which *see*).

RHAPIS. To the species described on pp. 287-8, Vol. III., the following should now be added:

R. Kwamwonzick (a native name). *l.* palmately divided into from four to seven lanceolate segments; petioles unarmed. Stems slender, leafy. Japan (?). Stove. (I. H. xxxiv. 13.)

RHIPSALIS SARMENTACEA. This species (described on p. 290, Vol. III.) should be grown in a basket of peat-fibre, or, better still, on a piece of soft Fern-stem. See Fig. 60, p. 598.

RHODODENDRON. Including *Vireya*. To the species and varieties described on pp. 292-8, Vol. III., the following should now be added:

R. albescens (whitish). *fl.* white, scented, large, the upper segments marked at the base with sulphur-yellow. *l.* glabrous, the under surface silvery-white.

R. Andersoni (Anderson's). *fl.* bright carmine. Himalayas. A garden name for what is probably a form of *R. arboreum*.

R. Apoanum (Apo). *fl.* red, small, tubular, about ½in. long, with spreading lobes; trusses few-flowered. *l.* narrowly elliptic, acute at both ends, green above, rusty beneath. Philippine Islands, 1885. A small shrub. (R. G. 1196 [1195 in text.])

R. assamicum (Assam). A garden name of *R. formosum*.

R. Collettianum (Major Collett's). *fl.* white, in dense, terminal corymbs, shortly pedicellate, surrounded with broad, ciliated scales; sepals five, obtuse; corolla nearly 1in. long, funnel-shaped; stamens ten. May. *l.* 2in. to 3in. long, very coriaceous, elliptic-oblong or -lanceolate, acute at both ends, opaque above, lepidote-scaly beneath; petioles ¼in. to ½in. long. Branchlets furfuraceous-pubescent. *h.* 8ft. to 10ft. Afghanistan. Hardy. (B. M. 7019; G. C. ser. iii., vol. iv., p. 297.)

R. Curtisii (Curtis'). A synonym of *R. multicolor*.

R. grande roseum (rosy). *fl.* of a lively rose-colour, with darker veins on the lobes, and obscure spots on the tube within. 1887. (B. M. 6948.)

R. graveolens (strongly-scented). *fl.* pure white, fragrant. A dwarf and free-flowering hybrid between *R. formosum* and *R. Sesterianum*.

R. jasminiflorum carminatum (carmine). *fl.* rich carmine, slightly toned with orange-scarlet around the base of the limb, the tube paler externally. 1886. A hybrid between *R. jasminiflorum* and *R. javanicum*.

R. javanicum tubiflorum (tube-flowered). *fl.* orange-red; corolla tube elongated. June. *l.* smaller than in the type, the midrib impressed above. Sumatra and Java, 1885. (B. M. 6850.)

R. Kochii (Koch's). *fl.* white, 1¾in. long, tubular, with a campanulate limb, something like those of *R. jasminiflorum*, disposed in loose trusses. *l.* petiolate, oblong-lanceolate, acuminate, 5in. to 6in. long, narrowed to the petioles, which are ½in. to 1½in. long. Philippine Islands, 1885. Stove shrub. (R. G. 1195 [1196 in text].)

R. Lochæ (Lady Loch's). *fl.* rather large, in terminal, umbelliform fascicles, on very conspicuous stalklets; corolla bright red, scaly-dotted outside, the tube cylindrical, the limb bluntly five-lobed and conspicuously veined. *l.* persistent, mostly whorled, some scattered, conspicuously stalked, flat, nearly ovate, rather blunt, glabrous, minutely scaly-dotted beneath. *h.* 20ft. Mount Bellenden-Ker, 1887. This tree is the only known Australian Rhododendron.

R. Manglesii (Mangles'). A fine, half-hardy, garden hybrid, having handsome, white flowers, disposed in very large heads.

Rhododendron—*continued.*

1886. *R. Aucklandii* is one of the parents, and a garden hybrid the other.

R. multicolor (many-coloured). *fl.* few, horizontal, in terminal umbels; calyx minute; corolla dark red or bright yellow, 1in. long, between funnel- and bell-shaped, the five lobes equal, one-third the length of the tube. Winter. *l.* whorled, three to seven together, 2in. to 3in. long, ½in. to ⅔in. broad, elliptic-lanceolate, narrowed at both ends, contracted into the short petioles, dull green above, paler beneath. Sumatra. A small, glabrous, slender bush. (B. M. 6769.) SYN. *R. Curtisii* (F. & P. 1884, 615).

R. roseum odoratum (rosy, scented). *fl.* pale rose-coloured, fragrant, rather small, disposed in good-sized heads. 1886. Garden hybrid.

R. Sesterianum (Sester's). A white-flowered, garden hybrid, of which *R. Edgworthii* is one of the parents.

R. Smirnowi (Smirnow's). *fl.* deep purplish-scarlet, corymbose-umbellate; calyx minute, pelviform, the lobes very short; corolla campanulate, about 1¼in. long, obtusely five-lobed. *l.* 4½in. long, coriaceous, evergreen, oblong, rather obtuse at apex, cuneate at base, the margins revolute, glabrous above, beneath (as well as on the petioles, peduncles, and pedicels) densely white-floccose-tomentose. Caucasus, 1886. A tall shrub. (R. G. 1226, f. 2, d-g.)

R. Ungerni (Baron Ungern-Sternberg's). *fl.* white, corymbose-umbellate; calyx small, five-parted, the segments elongated; corolla campanulate, obtusely five-lobed, the lobes reddish on the back. *l.* coriaceous, persistent, oblong, nearly 7in. long, narrowed towards the base, cuspidate at apex, glabrous above, white-floccose-tomentose beneath; petioles (as well as the branches) tomentose-puberulous. Caucasus, 1886. A tall shrub. (R. G. 1227, f. 1, a-c.)

R. Victorianum (Victor's). *fl.* pure white, except the golden-yellow interior of the funnel-shaped tube, as freely produced as those of *R. Dalhousiæ;* limb spreading, five-lobed. *l.* as in *R. Nuttallii.* 1887. A garden hybrid between the species named.

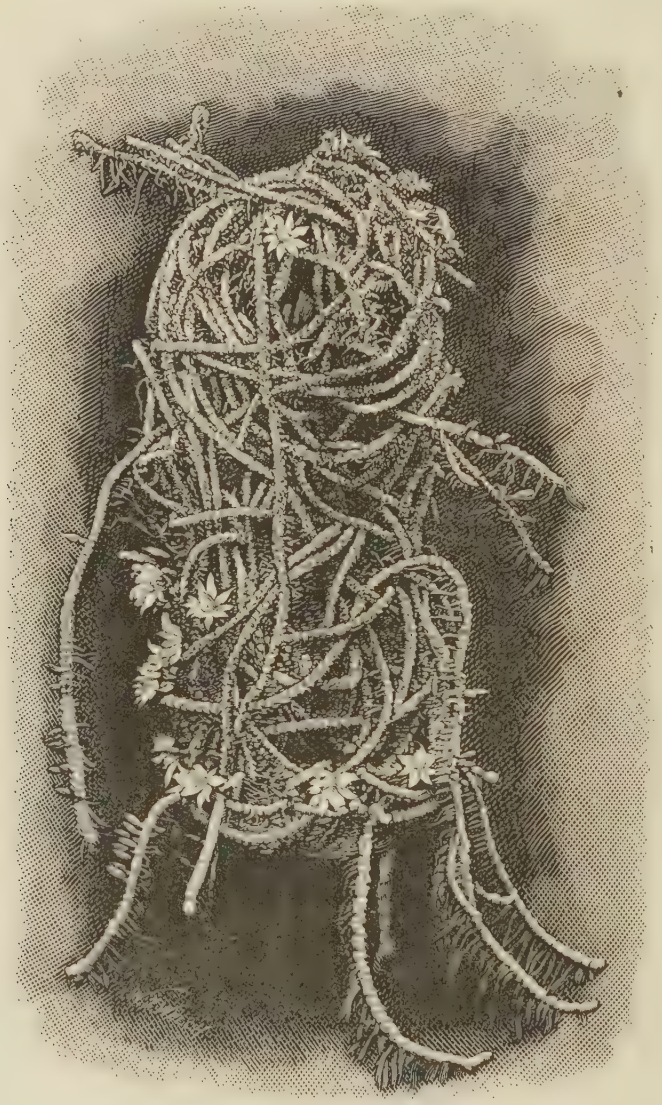

FIG. 60. RHIPSALIS SARMENTACEA (see p. 597).

Rhododendron—*continued.*

R. Williamsii (Williams'). *fl.* white, slightly spotted in the upper segments, freely produced. 1885. A hybrid between a species of *Rhododendron* and *Azalea sinensis.*

R. yedoënse (Yedo). *fl.* pale blush-coloured, double, about three in an umbel; calyx segments linear-oblong, acute, slightly serrated, white-bristly; corolla tube funnel-shaped, the limb campanulate. *l.* sub-caducous, oblong-lanceolate, shortly acuminate, spreading, in groups of about five at the tips of the branchlets, membranous-chartaceous, the autumnal ones smaller, linear-spathulate. Japan, 1886. (R. G. 1233 a-b.)

RHYNCHANTHUS (from *rhynchos*, a beak, and *anthos*, a flower; in allusion to the peculiar shape of the blossoms). ORD. *Scitamineæ.* A monotypic genus. The species is a very curious, stove, tuberous-rooted herb, remarkable in having very small corolla lobes, a lip reduced to a mere point, a most curious, petaloid filament, resembling a long canoe, exserted far beyond the corolla lobes, and terminated by an anther with no appendage, and an erect, funnel-shaped stigma. For culture, *see* **Heliconia,** on p. 128, Vol. II.

R. longiflorus (long-flowered). *fl.* 4in. long, few, erect, in a terminal, sub-sessile spike; bracts two, pale orange-red, 1¼in. long; calyx tubular, with a split mouth, and a rounded, retuse tip; corolla pale yellowish-green, the tube 2in. long, the lobes ¼in. long; filament straw-coloured. July. *l.* 6in. to 8in. long, 1½in. broad, oblong-lanceolate, acuminate, edged brown, contracted into short petioles. Stem 1½ft. high, with ten to twelve leaves. Birma, 1885. (B. M. 6861.)

RHYNCHOSTYLIS. To the species described on p. 302, Vol. III., the following variety should now be added:

R. retusa Russeliana (Russel's). *fl.*, sepals white; petals spotted with mauve-purple; lip mauve-purple, with a white apex; racemes long, dense pendulous. 1886. A fine form. (W. O. A. 238, under name of *Saccolabium Blumei Russelianum.*)

RICINUS. To the species described on p. 308, Vol. III., the following variety should now be added:

R. cambodgensis (Cambodia). Probably a form of *R. communis*, with large leaves and blackish stem and branches.

RODRIGUEZIA. To the species described on p. 311, Vol. III., the following should now be added:

R. Bungerothii (Bungeroth's). *fl.* purple; sepals and petals resembling those of *R. secunda;* lip cuneate-obovate, bilobed, with a well-developed, triangular, descending spur; column quite naked, white; inflorescence dense. Venezuela. A near ally of *R. secunda.*

R. Leeana picta (painted). *fl.* covered with numerous mauve-purple lines and spots, which are almost circular on the fine lip. A fine variety. 1885.

ROËZLIA REGIA. A garden synonym of **Furcræa Roëzlii** (which *see*).

ROMULEA. To the species described on pp. 312-3, Vol. III., the following should now be added:

R. Macowani (Macowan's). *fl.* 1in. to 1½in. in diameter, bright golden-yellow in the lower part, lighter upwards, often tinged red at the tips. *l.* linear, curved. South Africa. Greenhouse. (G. C. ser. iii., vol. i., pp. 180, 184, f. 42.)

RONNBERGIA. Two species are now referred to this genus. To that described on p. 313, Vol. III., the following should now be added:

R. columbiana (Columbian). *fl.* dark blue, with a white tube, hypocrateriform; spike short; bracts brownish, membranous. *l.* rosulate, very coriaceous, arched, wavy, smooth, dark green above, violet-brown beneath, bordered with small teeth. Stem 1ft. high. Columbia. The correct name of this plant is *Bilbergia columbiana.*

ROSA. To the species and varieties described on pp. 319-25, Vol. III., the following should now be added:

R. Godefroyæ (Godefroy's). *fl.* white, large; sepals longer than the buds; petals numerous. *l.*, leaflets five to seven, shining, dark green. Persia, 1886. A compact, glabrous bush; probably a garden variety.

Hybrid Perpetual Roses.

The large numbers of this section of garden and exhibition Roses annually introduced from the Continent necessitate very careful selection. The following are the best and most recent additions:

Rosa—*continued.*

AVOCAT DUVIVIER, crimson-purple; BARONESS NATHANIEL DE ROTHSCHILD, silvery-pink; BOILDIEU, bright cherry-rose; BOULE DE NEIGE, pure white; CHARLES LEFEBVRE, bright, shaded crimson; DR. SEWELL, crimson-scarlet; DUC DE MONTPENSIER, bright red; DUCHESS OF ALBANY, deep, clear pink; DUKE OF CONNAUGHT, velvety crimson; ELIE MOREL, rosy-lilac; FLORENCE PAUL, scarlet-crimson; FRANÇOIS LOUVAT, crimson, shaded lilac; GRAND MOGUL, rich crimson, deep scarlet shade; JOHN BRIGHT, rich, glowing crimson; LE HAVRE, vermilion; LORD DUFFERIN, crimson, shaded maroon; MADAME EUGENE VERDIER, bright, pleasing rose; MADAME MARIE VERDIER, bright satin rose; MARY BENNETT, rosy-cerise; MISS HASSARD, pink; MRS. JOHN LAING, soft pink; MRS. LAXTON, bright rosy-crimson; PENELOPE MAYO, carmine-red; PRIDE OF WALTHAM, delicate flesh, with rose shade; PRINCESS MARY OF CAMBRIDGE, rosy-flesh; ROYAL STANDARD, satiny rose; SILVER QUEEN, silvery-blush, centre shaded pink; SIR GARNET WOLSELEY, rich vermilion; THE PURITAN, fully-opened flowers pure white; VILLARET DE JOYEUSE, shaded rose; VIOLET BOUYER, delicate pink.

Tea-scented Roses.

ALBA ROSEA, white, peach-coloured centre; COMTESSE PANISSE, coppery-rose, tinged yellow; FRANCISCA KRUGER, salmon-yellow; GRACE DARLING, creamy, tinted pink; LE MONT BLANC, pure white; MADAME AJELIE IMBERT, yellowish-salmon; MADAME CHARLES, apricot; MADAME CUSIN, rose, yellow base; MISS EDITH GIFFORD, creamy-white; MISS ETHEL BROWNLOW, salmon-pink; MONS. FURTADO, clear yellow; PRESIDENT, pale rose; PRINCESS BEATRICE, yellow with deeper centre; THE BRIDE, creamy-white.

Hybrid Tea Roses.

MADAME JOSEPH DESBOIS, white, salmon centre; REINE MARIE HENRIETTE, reddish-crimson; WALTHAM CLIMBER No. 3, crimson.

Noisette Roses.

BEAUTY OF GLAZENWOOD, buff, striped crimson; BOUQUET D'OR, yellow, darker centre; CLAIRE CARNOT, coppery-yellow; JAMES SPRUNT, crimson.

ROYDSIA (named by Dr. Roxburgh in honour of Sir John Royds, "one of the Puisne Judges of the Supreme Court of Judicature of Bengal, and an eminent benefactor to the Science"). ORD. *Capparideæ.* A small genus (two species) of stove shrubs, natives of the East Indies and the Philippine Islands. Flowers yellow, small, fragrant, axillary and in terminal panicles; sepals six, coloured, imbricated or sub-valvate; petals none; torus short; stamens very numerous; pedicels bibracteate at base. Fruit red, olive-shaped. Leaves ample, shortly petiolate, simple, oblong, exstipulate. *R. suaveolens*, the only species introduced, is a rather coarse, rambling bush, well worth cultivating for its delicious fragrance by those who can give it space enough: it is not suited for small houses. The plant thrives in good, rich, loamy soil, and may be readily increased by cuttings of the young wood.

R. suaveolens (sweet-scented). *fl.* numerous, ⅜in. in diameter, fragrant; stamens about 100, spreading; racemes axillary, or rather above the axils, 3in. to 7in. long, solitary or in terminal panicles. January to May. *fr.* 1in. to 1½in. long. *l.* alternate, 4in. to 12in. long, oblong or oblong-lanceolate, rarely oblanceolate, acute or acuminate, entire, shining, pale beneath; petioles ¼in. to ½in. long. East Indies. (B. M. 6881.)

RUBUS AMERICANUS. A garden synonym of **R. villosus** (which *see*, on p. 332, Vol. III.).

SACCOLABIUM. To the species and varieties described on pp. 340-1, Vol. III., the following should now be added:

S. giganteum Petotianum (Petot's). *fl.* dull white, large and rigid. Cochin China, 1885.

S. Pechei (Peche's). *fl.*, sepals and petals ochre, with red spots, cuneate-oblong, blunt-acute; lip forming a cupular spur, having a few red spots at the yellow base of the spur, the side laciniæ retuse and angular over the transversely triangular, nearly white mid-lacinia; raceme few-flowered. *l.* broadly ligulate, blunt, bilobed at apex, 7in. long, nearly 2in. broad. Moulmein, 1887.

S. Smeeanum (Smee's). *fl.*, sepals and petals greenish-white, with mauve mid-veins, becoming whitish-ochre with brown-purple stripes, the sepals oblong-ligulate, the petals nearly so; lip white, becoming yellow, the disk of the oblong, acute mid-lacinia mauve, turning brown, the side laciniæ very small; peduncles bifid, each branch closely racemose. 1887.

SALIX. To the species and varieties described on pp. 345-7, Vol. III., the following should now be added:

S. lasiandra lancifolia (hairy-anthered, lance-leaved). *fl.*, catkins greenish-yellow, about 2in. long, borne on short, lateral shoots. *l.* lanceolate, acuminate, 6in. to 10in. long, finely serrated; stipules reniform. California. (R. G. 1887, pp. 409-10, f. 98.)

S. repens. Creeping Willow. *fl.*, catkins cylindrical, usually about ¼in. long, sessile, at length pedunculate and 1in. long. Spring. *l.* oblong or lanceolate, less than 1in. long, rarely shortly ovate, or in luxuriant shoots narrow-oblong and 1½in. long, nearly or quite entire, silky. Europe (Britain) and Asia. A low, straggling shrub. A series of forms of this species is figured in Sy. En. B. 1356-62.

SALVIA. To the species described on pp. 349-53, Vol. III., the following should now be added:

S. scapiformis (scape-formed). *fl.*, calyx ⅛in. long; corolla pale amethystine-blue, the limb ⅝in. in diameter; whorls numerous; scapes 6in. to 10in. high, ascending. June. *l.* all radical (rarely with an opposite pair towards the base of one or more of the scapes), 2in. long, spreading, broadly ovate- or oblong-cordate, obtuse, coarsely crenate or lobulate, reddish-purple beneath. Formosa. Greenhouse perennial. (B. M. 6980.)

SAMBUCUS. To the species and varieties described on p. 354, Vol. III., the following should now be added:

S. racemosa serratifolia (serrated-leaved). *l.* rather narrower than in the form *plumosa*, and not so deeply pinnatifid. 1886.

SANSEVIERA. To the species described on p. 356, Vol. III., the following should now be added:

S. aureo-variegata (golden-variegated). *l.* oblong-obovate, thick, leathery, pale green in the centre, with two broad bands of creamy-white, and a narrow, pale green margin.

SARCOCHILUS. To the species described on pp. 360-1, Vol. III., the following should now be added:

S. indusiatum (smocked). *fl.* small, disposed in short, dense racemes; sepals and petals yellowish, spotted red; lip white; spur cylindric, with "a kind of bucket" at its apex. *l.* soft, shining, oblong, 3in. broad. Sunda Isles, 1886. SYN. *Thrixspermum indusiatum.*

S. purpureus (purple). *fl.* pale rose-coloured; lip of a deeper rosy-crimson than the sepals and petals, hollowed out near the tip somewhat in the form of a slipper; spikes about 8in. long, many-flowered. *l.* distichous, oblong-linear, emarginate, 3in. to 4in. long. India. SYN. *Camarotis purpurea* (L. S. O. 19; P. M. B. vii. 25).

S. unguiculatus (clawed). *fl.*, sepals and petals light straw-colour; lip clawed, three-lobed, the side lobes white, streaked crimson, the middle lobe rounded, fleshy, dotted crimson; raceme three or four-flowered. Manilla, 1848. SYNS. *Phalænopsis Ruckeriana* (of gardens) and *Thrixspermum unguiculatum.* (W. O. A. vi. 266.)

SAROTHAMNUS SCOPARIUS ANDREANUS. A synonym of **Cytisus Andreanus** (which *see*).

SARRACENIA. To the species and hybrids described on pp. 363-7, Vol. III., the following should now be added:

S. porphyroneura (purple-nerved). *l.* erect, with a large, circular lamina, which, as well as the upper portion of the pitcher itself, is traversed by purple veins. 1882.

S. Wilsoniana (Wilson's). *l.* erect, with deep purple-crimson ribs, more or less united by cross veins; wing and lid veined and reticulated deep purple-crimson. A distinct and pleasing hybrid between *S. flava* and *S. purpurea.*

SAXIFRAGA. To the species and varieties described on pp. 371-6, Vol. III., the following should now be added:

S. aretioides micropetala (small-petaled). A synonym of *S. lutea-purpurea.*

S. Engleri (Engler's). *fl.* white, small. *l.* thick, deep green, gradually changing to golden-yellow in winter, with slight crustaceous margins. North America.

S. Frederici-Augusti (Frederick Augustus'), of gardens. A synonym of *S. lutea-purpurea.*

S. Huguenini (Huguenin's). *fl.* white, solitary, shortly stalked. *l.* imbricating, oblong, ciliate-toothed, ⅛in. to ¼in. long. Eastern Swiss Alps, 1836. A neat little plant, of creeping, tufted habit. (R. G. 1230 B.)

S. Lapeyrousei (Lapeyrouse's). A synonym of *S. lutea-purpurea.*

S. lutea-purpurea (yellow and purple). *fl.* lemon-yellow, numerous, corymbose, borne on short, leafy stalks. Spring. *l.* bright green, narrow-lanceolate, disposed in small rosettes. Pyrenees. Plant very dwarf. SYNS. *S. aretioides micropetala,*

Saxifraga—*continued.*

S. Frederici-Augusti (of gardens), *S. Lapeyrousei.* The true *S. Frederici-Augusti* is a rare and distinct plant, with a spicate inflorescence and purple flowers, and is not at present in cultivation in this country.

SCHIZANTHUS. To the species described on p. 384, Vol. III., the following variety should now be added:

S. Grahami lilacinus (lilac). A fine variety, having lilac-coloured flowers, with a dark golden-yellow, brown-veined upper lip, and lilac tips. (R. G. 1887, p. 665, f. 169.)

SCHIZOCASIA (from *schizo*, to cut or split, and *casia*; in allusion to its divided leaves and its relationship to *Colocasia*). ORD. *Aroideæ* (*Araceæ*). A small genus (three or four species) of stove herbs, with a thick caudex, natives of New Guinea, Siam, and the Philippine Islands. Flowers monœcious, on an appendiculate spadix, the males and females remote; perianth none; spathe tube convolute, the blade linear-oblong, obtuse, thrice as long as the tube, the throat constricted; peduncle short, sheathed. Leaves ovate-cordate, pinnatipartite; petioles elongated, terete. According to Mr. N. E. Brown, there are no real characters to separate *Schizocasia* from **Alocasia** (which *see*, on p. 50, Vol. I., for culture).

S. Portei (Porte's). *l.* oblong-triangular, sagittate, pinnatipartite; lateral divisions semi-ovate or oblong, obtuse, with a deep sinus; stalks half as long again as the leaves. Caudex thick.

S. Regnieri (Regnier's). *fl.* unknown. *l.* large, pinnatifid, 10in. to 12in. long, peltate, repand, dark green above, the midrib and principal nerves much paler, glaucescent beneath, the margins undulated; pinnæ costate, mucronate at apex, cordate-lanceolate; petioles 1½ft. long, sheathing at base, terete, yellow, with reddish, hieroglyphic markings. Siam, 1887. (I. H. ser. v. 6.)

SCHŒNOCAULON (from *Schoinos*, a Rush, and *kaulos*, a stem; in allusion to the Rush-like scape). SYNS. *Asagræa, Sabadilla.* ORD. *Liliaceæ.* A small genus (five species have been enumerated) of half-hardy, bulbous plants, natives of the Mexico-Texan region. Flowers rather small, in long, dense, terminal, sub-sessile spikes; perianth persistent, the segments distinct, subequal, narrow-lanceolate or linear, erecto-patent; stamens six, hypogynous, longer than the segments; bracts small; scape simple, tall, leafless. Leaves radical, long-linear. The culture of the only species introduced is not yet understood; the plant is, however, only of botanical interest.

S. officinale (officinal). *fl.*, perianth yellowish, ⅛in. to ¼in. long, the segments lanceolate; spike cylindrical, 6in. to 12in. long, ¼in. in diameter; scape 2ft. to 3ft. long. September. *l.* six to twelve, firm, 1½ft. to 4ft. long, three to six lines broad. Bulb ovoid, 1in. to 2in. in diameter. SYN. *Asagræa officinalis* (B. R. 1839, 33).

SCHOMBURGKIA. To the species described on p. 386, Vol. III., the following should now be added:

S. chionodora (snow-gift). *fl.* white, with a purple spot on the lip, numerous; sepals ligulate, acute; petals spathulate, blunt; lip large, four-lobed, toothleted and wavy, with five entire keels on the disk. *l.* cuneate-oblong, obtuse, 4in. to 5in. broad. Pseudo-bulbs many-angled, 1ft. long or more, having but a single, central cavity. Central America, 1886.

S. c. Kimballiana (W. S. Kimball's). *fl.* light purple; inflorescence with numerous branches. 1888.

S. Humboldtii (Humboldt's). *fl.* resembling those of a Lælia; sepals and petals wavy, pale lilac, the petals tinted purple towards the apex; lip with triangular, amethyst-purple side lobes, and a bilobed, fringed and crisped front lobe, of a bright purple, with paler streaks, the disk yellow, with five to seven keels, purple towards their base. Venezuela.

S. marginata immarginata (not margined). This is chiefly dependent for its character on the absence of yellow margins on the sepals and petals. 1887.

S. Thomsoniana (Thomson's). *fl.* light yellow and sulphur, with purple markings; sepals and petals ligulate, acute, undulated; lip trifid, the lateral segments triangular, extrorse, obtuse, the middle one ligulate, emarginate, much crisped. 1887. Allied to *S. tibicinis.* SYN. *Bletia Thomsoniana.*

SCHUBERTIA GRANDIFLORA. A synonym of **Arauja grandiflora** (which *see*).

SCILLA. To the species described on pp. 388-91, Vol. III., the following should now be added:

S. Bellii (Bell's). *fl.*, perianth brownish-blue, campanulate, ¼in. long, the segments oblong-spathulate; bracts white; raceme

FIG. 61. SELAGINELLA PERELEGANS, SHOWING HABIT AND PORTION OF DETACHED FRUCTIFEROUS BRANCH.

Scilla—*continued.*

short, ten to twelve-flowered; scape slender, terete, 3in. to 4in. long. Spring. *l.*, produced ones two or three, oblong-lanceolate, 3in. to 4in. long, acute, erect, fleshy. Laristan, Central Persia, 1884.

S. lingulata (tongue-shaped). *fl.*, perianth blue, campanulate, star-like, about ¾in. long; raceme oblong, rather dense, six to fifteen-flowered; scape 2in. to 4in. long. Spring. *l.* six to eight, fleshy-herbaceous, glabrous, ascending, lingulate-lorate, embracing the scape at base, 2in. to 3in. long, four to six lines broad. Bulb six to eight lines thick. Algeria, Morocco, 1887. (R. G. 1261, f. 2.) The variety *alba* (R. G. 1261, f. 4) has white, and *lilacina* (R. G. 1261, f. 3) lilac, flowers.

SCOLOPENDRIUM. To the varieties of *S. vulgare* described on pp. 393-4, Vol. III., the following should now be added:

S. vulgare ramo-marginatum (branched, margined). Similar to the form *lato-digitatum*, but with the contracted and lined character of *marginatum* in the leafy portion and elsewhere.

S. v. Valloisii (Vallois'). A strong-growing variety, having the fronds dilated and irregularly divided and crested at their summit, forming large, bunch-like tufts. (R. H. 1886, p. 447, f. 114.)

SEDUM. To the species and varieties described on pp. 403-7, Vol. III., the following should now be added:

S. edulis (edible). A synonym of *Cotyledon edulis.*

S. formosanum (Formosa). *fl.* bright yellow, mostly sessile, bracteate; petals lanceolate, acuminate, spreading. Summer. *l.* one to three, whorled, 1in. to 1¼in. long, ⅛in. broad, flat, spathulate, obtuse, recurving towards the apex, softly succulent. Stem repeatedly branched from near the base. *h.* about 6in. Formosa, 1885. A glabrous, half-hardy or greenhouse annual.

SELAGINELLA. To the species described on pp. 409-12, Vol. III., the following should now be added:

S. gracilis (slender). *stems* 2ft. to 3ft. long, sub-erect, pinnately branched, rather rough; pinnæ narrow-lanceolate, 4in. to 5in. long; pinnules simple, the lower ones 1in. long, ⅛in. broad. *l.* bright green, ovate-falcate; stipular ones narrow-lanceolate, cuspidate, parallel and close-set. *spikes* terminal, tetragonal, ¼in. to 1in. long. South Sea Islands, 1886. An elegant, stove species.

S. perelegans (very elegant). The correct name of this plant is *S. inæqualifolia perelegans* (under which it is described on p. 411, Vol. III.) See Fig. 61, p. 601, for which we are indebted to Messrs. W. and J. Birkenhead.

S. tassellata (tasselled). *stems* erect; branches and branchlets flat, closely pinnate, the tips furnished with fertile, quadrangular spikelets about 1½in. long, giving the plant a tasselled appearance. Brazil, 1887. Stove. See Fig. 62, p. 603, for which we are indebted to Mr. Wm. Bull.

S. viridangula (green-angled). *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ deltoid, 1ft. long, erecto-patent; pinnules with simple upper and compound lower erecto-patent tertiary divisions; ultimate segments usually ⅛in. to 1in. long, bright green at base. *l.* of the lower plane contiguous or nearly so on the branchlets, lanceolate-falcate, acute, ⅛in. to ⅛in. long (⅛in. long and much spaced on the pinnæ), bright green, dilated; leaves of the upper plane very small, distinctly cuspidate. *spikes* square, 1in. to 2in. long; bracts strongly keeled. Mountains of Fiji, 1884. Stove.

SELENIPEDIUM. To the species and varieties described on pp. 413-4, Vol. III., the following should now be added:

S. Boissierianum (Boissier's). *fl.* yellow, veined and tinged with bright green, marked brownish-crimson on the edges of the sepals and in other places; petals curiously twisted and horizontally extended, the edges erose; lip rounded. 1887. (G. C. ser. iii., vol. i., p. 143.)

S. leucorrhodum (white and rose). *fl.* white, nearly like those of *S. Roezlii* in shape; upper sepal washed purple; petals beautifully margined purple, and having very stiff, purple hairs at the base inside; lip marked purple and sulphur, and with brown spots inside at the bottom, the sac purple; peduncle hairy. *l.* very broad and firm. 1885. A hybrid between *S. Roezlii* and *S. Schlimii albiflorum.*

S. Saundersianum (Saunders'). *fl.* large; dorsal sepal white, striped purple and green, oblong-triangular, the lateral ones white, green at top, broad and wavy; petals reddish-purple, broad, ligulate, undulated; lip bright reddish-mauve, hemispheric in front. *l.* bright green. 1888. A hybrid between *S. caudatum* and *S. Schlimii.*

S. Schröderæ splendens (splendid). A very brilliant variety. 1887. (... ii. 69.)

SILENE. To the species described on pp. 432-3, Vol. III., the following should now be added:

Silene—*continued.*

S. pusilla (dwarf). A tiny plant, rarely exceeding 1½in. in height, forming a dense mass; the flowers, which are about ¼in. in diameter, are so profusely produced as to almost entirely hide the foliage. It is a charming little subject, either for pot culture or for growing on the rockery. 1887. (G. C. ser. iii., vol. ii., p. 44.)

SILPHIUM. To the species described on p. 435, Vol. III., the following should now be added:

S. albiflorum (white-flowered). *fl.-heads* sessile in the axils or stoutly pedunculate, 3½in. across; involucre sub-globose; ray florets pale straw-coloured or creamy-white, narrowly oblong, bifid. September. *l.* ovate, pinnatifid or bipinnatifid, coriaceous, the uppermost ones linear; lobes linear, 2in. to 5in. long. Stem simple, 2ft. to 4ft. high. Texas. Plant clothed with short prickles. (B. M. 6918.)

SOLANUM. To the species and varieties described on pp. 452-6, Vol. III., the following should now be added:

S. albidum Poortmanni (Poortmann's whitish). *fl.* white, small, produced in numerous cymes, towards the end of the season, on the young, white-tomentose shoots. *l.* large, pinnatifid, 2ft. long, bright green above, white-tomentose beneath. Andes, 1886. A noble, half-hardy perennial. (R. H. 1886, p. 232, f. 67.)

S. jasminoides floribundum (abundant-flowered). A more floriferous plant than the type, and having smaller and less pinnatifid leaves. 1886. Garden variety.

SOPHROCATTLEYA BATEMANNIANA. A synonym of the hybrid *Lælia Batemaniana* (described on p. 460, Vol. III., under name of *Sophronitis grandiflora*).

SOPHRONITIS. To the species and varieties described on p. 460, Vol. III., the following should now be added:

S. grandiflora aurantiaca (orange). A variety with dark orange-red flowers. 1886. (R. H. 1886, p. 492.)

SPAENDONCEA. A synonym of **Cadia** (which *see*).

SPATHOGLOTTIS. To the species described on p. 467, Vol. III., the following should now be added:

S. Augustorum (named in honour of Auguste Linden and Auguste de Rhonne, two travellers and collectors). A synonym of *S. Vieillardii.*

S. Regnieri (Regnier's). This is closely allied to *S. Lobbii.* It differs as follows: *fl.* smaller, having no stripes on the lateral sepals; stalked ovaries shorter; side partitions of the lip shorter and broader; callus standing more backwards; peduncle having shorter hairs. *l.* much broader. Cochin China, 1887.

S. Vieillardii (Vieillard's). *fl.* pale lilac, disposed in a nearly capitate raceme; lip tripartite, the side lobes rectangular, retuse, the mid-lobe long-clawed, oblong, two-lobed at apex. *l.* broadly cuneate-oblong, acute. Pseudo-bulbs ovoid, tinted brown. Sunda Isles, 1886. SYN. *S. Augustorum* (L. 25).

SPIRÆA. To the species and varieties described on pp. 474-8, Vol. III., the following should now be added:

S. bullata (inflated). *fl.* dark pink or claret-coloured, in much branched, dense, terminal corymbs; pedicels short, villous, bracteolate. Summer. *l.* sub-sessile, ⅛in. long, coriaceous, glabrous, dark green and bullate above, paler beneath, ovate-oblong, crenate; nerves pinnate, very prominent on the under surface. Branches erect, wiry, cylindric, densely clothed with reddish-brown down. Japan. A dwarf shrub, 1ft. to 1½ft. high. (R. G. 1215). SYN. *S. crispifolia* (of gardens).

S. crispifolia (crisped-leaved). A garden synonym of *S. bullata.*

S. gigantea (gigantic), of gardens. A robust-growing form of *S. kamtchatica.*

S. kamtchatica (Kamtchatkan). *fl.* white, sweetly scented, larger than those of *S. Ulmaria*, corymbose; sepals reflexed, pilose; carpels very hairy. *l.* palmately lobed; upper cauline ones somewhat hastate or lanceolate; petioles appendiculate. *h.* 6ft. to 9ft. Kamtchatka and Behring's Island.

S. k. himalensis (Himalayan). *l.* white-downy beneath; segments often acuminate. (B. R. 1841, 4.)

SPIRANTHES. To the species and varieties described on p. 478-9, Vol. III., the following should now be added:

S. leucosticta (white-spotted). *fl.* green, with a brown-tipped lip, hairy; sepals lanceolate; petals linear, forming, with the dorsal sepal, the galea; lip ligulate, dilated in front, the apex obtusely triangular; raceme few-flowered. *l.* petiolate, oblong, acute, spotted white. Columbia, 1885.

FIG. 62. SELAGINELLA TASSELLATA.

SPORLEDERA. A synonym of **Ceratotheca** (which *see*).

STAPHYLEA. To the species described on pp. 489-90, Vol. III., the following should now be added:

S. Coulombieri (Coulombier's). Nearly allied to *S. colchica*, from which it differs in its more globular flowers, with broader and shorter sepals and petals, and in its later period of flowering. Really intermediate between *S. colchica* and *S. pinnata*. 1887. Garden variety.

STATICE. To the species described on pp. 491-3, Vol. III., the following should now be added:

S. superba (superb). A hardy annual, closely resembling *S. Suworowi*, but having the spikes densely crowded into a pyramidal panicle. 1887. (R. G. 1887, p. 666, f. 170.)

STELLERA ALBERTI. A synonym of **Wikstrœmia Alberti** (which *see*).

Streptocarpus—*continued.*

brownish-purple; stems numerous, bearing ten to sixteen flowers. Autumn and winter. *l.* solitary, similar to, but rather smaller than, that of *S. kewensis* (between which and *S. parviflora* this is a hybrid). 1887. (G. C. ser. iii., vol. ii., p. 215.)

STROBILANTHES. To the species described on pp. 516-7, Vol. III., the following should now be added:

S. attenuatus (attenuated). *fl.* violet-blue, marked with a yellow spot in the throat, disposed in loose panicles; corolla 1in. long; peduncles axillary or terminal, trifid, hairy. *l.* cordate, serrated, caudate-acuminate, more or less hairy, 4in. long, 2½in. broad, dark green; petioles 3in. to 4in. long. Stem quadrangular, more or less hairy. Himalayas, 1886. A handsome, greenhouse herb, of shrubby habit. (R. G. 1243.)

S. coloratus (coloured). *fl.* pale bluish-purple, 1½in. long, shortly pedicellate; sepals erect, linear, ¾in. long; corolla with a ventricose tube and short, rounded lobes; panicles 6in. to 12in. high, widely spreading and profusely branched. January.

FIG. 63. FLOWERING BRANCH OF STROPHANTHUS DICHOTOMUS.

STRELITZIA. To the species and varieties described on p. 514, Vol. III., the following should now be added:

S. Reginæ citrina (citron-coloured). A variety with citron-yellow sepals. 1887.

STREPTOCALYX FURSTENBERGI. *See* **Tillandsia Furstenbergi.**

STREPTOCARPUS. To the species described on p. 516, Vol. III., the following species and hybrids should now be added:

S. kewensis (Kew). *fl.*, corolla bright mauve-purple, about 2in. long, striped with dark brownish-purple in the throat; stems numerous, six to eight-flowered, forming a tolerably compact mass. Autumn and winter. *l.* two or three, large, oblong- or elongate-ovate, bright green, not so large as those of *S. Dunnii* (between which and *S. Rexii* this plant is a hybrid). 1887.

S. lutea (yellow). The correct name of the plant figured in B. M. 6636, and described on p. 516, Vol. III., as *S. parviflora*.

S. parviflora (small-flowered). *fl.* pale blue or purplish; calyx somewhat five-parted; corolla tube about ¾in. long; pedicels twin, distant; peduncles three to ten-flowered. *l.* dense, ovate or oblong, narrowed at base, sub-sessile, 7in. long, crenate, softly villous, woolly beneath. South Africa.

S. Watsoni (Watson's). *fl.*, corolla bright rose-purple, about 1¼in. long and 1in. in diameter, the white throat striped with *l.* 5in. to 7in. long, ovate or elliptic, acuminate or produced into a long tail, serrated, dark green above, reddish-purple beneath. *h.* 4ft. to 6ft. Khasya, 1886. (B. M. 6922.)

S. flaccidifolius (flaccid-leaved). *fl.* lilac-purple, in loose, leafy, paniculate spikes; tube of the corolla bent, the lobes deeply notched. *l.* 2in. to 4in. long, elliptic-lanceolate, acute, narrowed to the petioles, serrated, glabrous, bright green. India, China, 1887. A pretty shrub, yielding a blue dye. (B. M. 6947.)

STROPHANTHUS. Many of the plants of this genus possess quaintly-coloured flowers, which are rendered still more strange by the long, tail-like expansions of the corolla lobes. The seeds of some of the species abound in a poisonous principle, which has been named Strophantin, and has been found successful as a remedy in cases of heart disease, principally in fatty degeneration of that organ. The Kombé arrow poison of the natives of Senegambia, &c., is furnished by *S. hispidus*. *S. dichotomus* (described on p. 520, Vol. III.) is shown at Fig. 63.

S. Ledienii (Ledien's). *fl.* borne in umbels terminating the woody branches; corolla buff-yellow, star-shaped, five-lobed, each lobe prolonged into a very long, narrow, ribbon-like tail; corona and stamens violet, with five white rays. *l.* nearly sessile, obovate, suddenly drawn out into a short point, the margins entire, both surfaces softly hairy. Congo, 1887. Stove shrub. (R. G. 1241.)

SUGEROKIA. A synonym of **Heloniopsis** (which *see*).

SWAINSONA. To the species and varieties described on pp. 527-8, Vol. III., the following should now be added:

S. Ferrandi alba (Ferrand's white). *fl.* yellowish-white in bud; corolla snow-white when fully expanded, with a broad, spreading standard; keel small; wings much reduced. Probably a garden variety of *S. galegifolia*.

SYNTHYRIS (from *syn*, together, and *thyris*, a little door; in allusion to the closed valves of the pod). ORD. *Scrophularineæ*. A genus comprising about half-a-dozen species of glabrous or pilose, hardy, perennial herbs, with thick rhizomes, natives of North-west America. Flowers bluish or reddish, racemose or spicate; calyx four-parted, the segments narrow; corolla tube very short or wanting, the lobes erecto-patent, imbricated; stamens two; peduncles scape-like, simple, with alternate, amplexicaul, leafy bracts. Leaves radical, petiolate, ovate, or oblong and crenate or incised-pinnatisect. For culture of the only species introduced, *see* **Veronica,** on p. 148.

S. reniformis (kidney-shaped). *fl.* pale violet, about ¼in. long; corolla lobes oblong-lanceolate, unequal; raceme erect, 4in. to 6in. long, many but not dense flowered; peduncle stout, 5in. to 10in. long. April. *l.* 1½in. to 2½in. in diameter, orbicular-cordate, coriaceous, doubly toothed. 1885. (B. M. 6860.)

SYRINGA. To the species and varieties described on pp. 536-7, Vol. III., the following should now be added:

S. Emodi aurea (golden). This only differs from the type in having the leaves blotched with dull yellow. 1886.

S. pekinensis (Pekin). *l.* opposite; petioles and midrib blackish-purple. Branchlets slender, velvety, dark red. North China, 1886. A very bushy shrub or small tree. SYN. *Ligustrina pekinensis*.

S. p. pendula (pendulous). This only differs from the type in its "weeping" habit.

TACSONIA. To the species described on pp. 3-4, the following should now be added:

T. Jamesoni (Jameson's). *fl.* bright, rich rose-colour, large; tube cylindrical, 4in. long; flower-stalk shorter than the leaves. *l.* glabrous, sub-orbicular, three-lobed, 2in. long, 2½in. broad. Ecuador. Greenhouse.

TAGETES. To the species described on pp. 4-5, the following should now be added:

T. gigantea (gigantic). *fl.* unknown. *l.* opposite, pinnate, having a balsamic odour; leaflets soft, narrowly elliptic, toothed. Stem stout, pruinose, 6ft. to 9ft. high. Bolivia, 1886. A stout, half-hardy herb.

TAPEINÆGLE. A synonym of **Tapeinanthus** (which *see*).

TAPEINANTHUS (from *tapeinos*, low, and *anthos*, a flower; in allusion to the dwarfish habit of the plant). SYNS. *Carregnoa*, *Gymnoterpe*, *Tapeinægle*. ORD. *Amaryllideæ*. A monotypic genus. The species is a small, tunicated-bulbous plant, which has not yet been successfully cultivated in this country.

T. humilis (dwarf). *fl.* solitary or twin, ¾in. in diameter; perianth yellow, funnel-shaped, with a very short tube, the segments narrow-oblong, erecto-patent, sub-equal, with a small scale at their base; scape very slender, 3in. to 4in. high. *l.*, perfect one appearing late, filiform, with a small, stipitate sheath at base. Spain, Tangiers, 1887.

TECOMA. To the species described on p. 13, the following should now be added:

T. amboinensis (Amboina). *fl.* orange-red, 3in. to 4in. long, freely produced in axillary racemes. *l.* pinnate. Amboina, 1886. A handsome, stove climber.

T. Mackenii (Macken's). A synonym of *T. Ricasoliana*.

T. Ricasoliana (Ricasol's). *fl.* in terminal panicles; corolla delicate rose-pink, with darker veins, the tube somewhat inflated or narrowly funnel-shaped, the limb spreading. *l.* pinnate; leaflets ovate, acute, toothed. South Africa, 1887. A handsome, greenhouse species. SYN. *T. Mackenii*.

TECOPHILÆA. To the species and variety described on p. 14, the following should now be added:

T. cyanocrocea Leichtlinii (Leichtlin's). *fl.* of a deep blue, as in those of *Gentiana verna*, without a trace of yellow. 1886.

TERMINALIA ELEGANS. A garden synonym of **Polyscias paniculata** (which *see*).

THALICTRUM. To the species and varieties described on pp. 23-4, the following should now be added:

T. adiantifolium (Adiantum-leaved). A form of **T. minus** (which *see*, on p. 24).

THEOPHRASTA IMPERIALIS. A synonym of **Chrysophyllum imperiale** (which *see*).

THUNBERGIA. To the species described on pp. 32-3, the following should now be added:

T. affinis (related). *fl.* ample, sub-solitary; corolla violet, the tube yellow within and tinged yellow outside, twice as long as the bracts, recurved above the base, the lobes ample, rounded, retuse. September. *l.* shortly petiolate, elliptic, acute or obtuse, entire, acute at base. Stem quadrangular, rambling. Zanzibar, 1886. "Perhaps a glorified form of *T. erecta*" (Sir J. D. Hooker). (B. M. 6975.)

THUYA. To the species and varieties described on pp. 33-4, the following should now be added:

T. tatarica compacta (compact). A garden variety, of compact, narrow, conical growth. 1886.

TIGRIDIA. To the species and varieties described on pp. 38-9, the following should now be added:

T. grandiflora alba (large-flowered, white). *fl.*, pearly-white, large, marked at the base of the perianth segments with large spots of reddish-brown on a yellowish ground. 1882. This plant has the general habit of *T. pavonia conchiflora*, from which it is presumed to have originated.

T. Pringlei (Pringle's). *fl.*, perianth with a campanulate base, blotched within with crimson; sepals 2½in. long, with a reflexed, scarlet limb; petals broadly cordate or reniform at base, the narrower, triangular-ovate, acute limb not spotted. July and August. Stem slender, 1ft. to 2ft. high, with two or three winged, plicate leaves, and a single flower. Bulbs small, with fusiform roots. Southern Mexico, 1888. (G. & F. i. 389.)

TILLANDSIA. To the species and varieties described on pp. 42-6, the following should now be added:

T. foliosa (leafy). *fl.* violet, produced in an ample panicle; bracts reddish. Mexico. A fine plant.

T. Furstenbergii (Furstenberg's). *fl.*, spikes erect, furnished with lanceolate, rosy bracts, dusted over with whitish meal. *l.* tufted, glaucous, linear-lanceolate, finely toothed, dilated at base. 1882. Acaulescent. The correct name of this plant is *Streptocalyx Furstenbergi*.

T. Pastuchoffiana (Pastuchoff's) *l.* broad, recurved, acuminate, clear, shining green, irregularly marked with a mosaic pattern of dark green lines. Brazil, 1885. Allied to *T. fenestralis*.

T. retroflexa (bent-back). *fl.* yellow, with green tips, spreading, distichous; bracts scarlet; scape scarlet, pendulous, bearing ten to fifteen flowers. 1885. This garden hybrid resembles *T. scalaris* in habit, but is stouter.

TODEA. To the species and varieties described on p. 50, the following should now be added:

T. grandipinnula (large-pinnuled). *fronds* ovate, tripinnate, 1ft. to 1½ft. long, 8in. to 9in. broad, pellucid-membranous; pinnæ sessile, crowded, oblong-ovate; pinnules overlapping, 1¼in. long, ovate, pinnatifid. 1886. A handsome, garden hybrid.

TORENIA. To the species described on p. 59, the following variety should now be added:

T. Fournieri compacta (compact). This differs from the type in its dwarfer and more compact habit. (R. G. 1887, p. 667, f. 172.)

TOURNEFORTIA. To the species described on p. 62, the following should now be added:

T. cordifolia (cordate-leaved). *fl.* white, small, in large, terminal, corymbose cymes. *l.* opposite, 1ft. long, cordate, acute; petioles 3in. to 4in. long. Tropical America, 1887. A greenhouse or half-hardy shrub, of bold habit, clothed with short hairs. (R. H. 1887, p. 128, f. 26-7.)

TRADESCANTIA MULTICOLOR. A garden name for a form of *Zebrina pendula*.

TRAGOPYRON. Included under **Atraphaxis** (which *see*).

TRICHOCENTRUM. To the species and varieties described on p. 79, the following should now be added:

T. albo-purpureum striatum (striated). *fl.* having a large purple blotch on each side of the base of the lip, and the apical part striped purple.

TRICHOPILIA. To the species described on pp. 83-4, the following should now be added:

T. laxa (loose). *fl.* in loose, erect racemes, produced out of broad, obtuse, short, membranous, spotted bracts; sepals and petals pale, watery green, faintly tinged with purple, erect, linear-lanceolate, equal; lip cream-colour. *l.* linear-oblong. SYN. *Pilumna laxa* (B. R. 1846, 57).

T. l. flaveola (yellowish). *fl.* having yellowish-white sepals and petals. 1884.

TRICHOSTEMA. To the information given on p. 86, the following should now be added. For culture, *see* **Salvia,** on p. 349, Vol. III.

T. Parishii (Parish's). *fl.* bluish-purple, with very long, projecting stamens, disposed in long, virgate, interrupted spikes; inflorescence wholly clothed with purple, woolly hairs. *l.* entire, linear. Stems simple. *h.* 1½ft. South California. An interesting, half-hardy sub-shrub.

TRIDAX. To the species described on p. 87, the following variety should now be added. It "has been treated as a half-hardy plant, but will probably succeed with the treatment afforded hardy annuals, if not sown too early" (W. Thompson).

T. bicolor rosea (two-coloured, pink). *fl.-heads* 1½in. to nearly 2in. across; ray florets rose-coloured, fifteen to eighteen, rather broad, three-toothed; disk yellow. Summer. *l.*, basal ones somewhat triangular, 2in. long, 1in. broad, strongly nerved, the margins widely toothed; upper ones becoming gradually narrower and smaller, most of them quite entire. *h.* 1ft. to 1½ft. North Mexico, 1887. (G. C. ser. iii., vol. ii., p. 553.)

TRITELEIA GRANDIFLORA. A synonym of **Brodiæa Douglasii** (which *see*).

TULIPA. To the species and varieties described on pp. 104-8, the following should now be added:

T. Billietiana (Cardinal Billiet's). A variety of *T. Didieri.*

T. Dideri Billietiana (Cardinal Billiet's). *fl.*, perianth wholly yellow, the outer segments acute, the inner ones rounded at apex. Switzerland, 1888.

T. linifolia (Flax-leaved). *fl.*, perianth of a brilliant vermilion-scarlet, nearly 2½in. in diameter, with a black blotch in the centre; segments spreading, alternately obcordate and cuneate; anthers yellow; scape 6in. high. *l.* about three, lanceolate, gradually tapering, boat-shaped, the margins crenate, revolute, 1886. (R. G. 1235, d-f.)

T. viridiflora (green-flowered). *fl.* pale yellow and green. An interesting plant, the origin of which is unknown—doubtless derived from *T. Gesneriana*, and flowering rather later than the type of that species. "Although it has no claim to beauty, it is of interest as being a possible progenitor of the far-famed Parrot Tulips of the present day" (D. Dewar). (Gn. xxxii. 514.)

VARIETIES. These choice old garden flowers are now being inquired after by amateurs. Many persons in the South of England seem desirous of emulating those amateurs near Manchester and in the Midland Counties who have continued to cultivate this historical flower through a period of comparative neglect. An old author says: "The Tulip asketh a rich soil and the careful hand of the gardener." This is well known to those who grow flowers for exhibition purposes, and they are ever careful to trench the ground up well, to manure it sufficiently, and, above all, to protect the delicate blossoms from beating rains. Canvas shading of some kind, fixed on a framework, the roof portion to move up and down on rollers, is usually adopted for this purpose.

The florists' Tulips are divided into six classes, viz.: (I.) Feathered Bizarres, (II.) Flamed Bizarres, (III.) Feathered Byblœmens, (IV.) Flamed Byblœmens, (V.) Feathered Roses, and (VI.) Flamed Roses. The varieties are very numerous; in fact, there are many hundreds grown under different names in England and on the Continent. On the other hand, the number of really good flowers, correct in their markings, with stamens unstained, and pure in the base of the cup, scarcely exceeds six in each class. The best exhibition varieties are here given.

I. Feathered Bizarres. COMMANDER (Marsden), ground-colour full, deep yellow, with heavy, almost black feathering; the colour improves as the flower expands to its full size. DEMOSTHENES (Headly), ground-colour rich, bright yellow, with reddish-brown feathering; it has usually a tinge of darker yellow round the base of the cup, which is a fault. GARIBALDI (Ashmole), ground-colour orange-yellow, with heavy, rich chestnut-brown feathering; very distinct. MASTERPIECE

Tulipa—*continued.*

(Slater), pure gold ground-colour, with a beautifully worked, glossy, raven-black feather; a splendid feathered Tulip. SIR JOSEPH PAXTON (Willison), ground-colour pure, deep, rich yellow, with beautifully pencilled, dark reddish-brown feathering. WILLIAM WILSON (Hardy), ground-colour beautiful, clear lemon-yellow, with very bold and richly pencilled, black feathering.

II. Flamed Bizarres. It may be well to remark here that the same variety of Tulip is found both in the feathered and in the flamed state, and one variety may be more esteemed as a feathered flower, while another is at its best in the flamed state. AJAX (Hardy), ground-colour lemon-yellow, flamed rich claret; a very distinct and effective variety. DR. HARDY (Storer), ground-colour rich, deep orange, vividly flamed reddish-scarlet; very rarely found in the feathered state. ORION (Storer), ground-colour rich orange-red, with a scarlet tint in the flame: a variety of beautiful form and great substance of petal. SIR JOSEPH PAXTON, ground-colour rich, deep yellow, brilliant in flame of a rich, dark reddish-brown; the finest flamed Tulip. SURPASS POLYPHEMUS (Barlow), ground-colour lemon-yellow, with massive flame of glossy black; probably distinct from, and decidedly superior to, the old flamed POLYPHEMUS; its base and stamens are always pure. WILLIAM LEA (Storer), ground-colour clear, rich lemon, with nearly black flame; a distinct and constant flower, of medium size only.

III. Feathered Byblœmens. ADONIS (Headly), ground-colour white, not so clear as in some varieties, but with pretty, light feathering, nearly black; a fine flower. ALICE GRAY (Walker), ground-colour a good white, feathered deep lilac, with a bluish tinge; a rather scarce variety, as it seldom gives any increase. FRIAR TUCK (Slater), ground-colour very good white, with heavy feathering of pale purple; a large, bold flower. MARTIN'S 101, ground-colour pure white, beautifully feathered chocolate-purple; a long, narrow-petaled variety. MRS. COOPER (Boardman), ground-colour pure white, with a feathering of rich chocolate, deepening to black as the flower matures; the best in this class, and a model feathered Tulip. TALISMAN (Hardy), ground-colour pure white, with richly-pencilled, bluish-black feathering; this variety often changes from the feathered state to the flamed, and generally remains so.

IV. Flamed Byblœmens. ADONIS, beam of the flame a rich, dark purple, with flashes of rich claret up the centre; a fine flower in the flamed state. BACCHUS, ground-colour good white, with lively purple flame; an old Dutch variety, never seen in the feathered state; very scarce, as it is slow of increase. CARBUNCLE (Headly), ground-colour good white, with rich, deep claret flame; a scarce and very beautiful variety, in the style of ADONIS. DAVID JACKSON (Jackson), ground-colour very pure white, with heavy flame of a decided black; a very distinct and handsome variety. DUCHESS OF SUTHERLAND (Walker), ground-colour pure white, with a clear, bold flame of light and dark purple; a long-petaled variety. TALISMAN (Hardy), ground-colour pure white, flamed purplish-black, a blue shade in the beam; the standard of excellence in this class.

V. Feathered Roses. ANNIE MCGREGOR (Martin), ground-colour very pure white, with brilliant scarlet feathering; the brightest flower in this lovely class. CHARMER, ground-colour good white, with light rose feathering; the best feathered form of a variety known as MABEL. HEROINE, ground-colour very pure white, with deep rose feathering; petals rather too long, and the outer ones rather pointed; a very old variety. INDUSTRY (Lea), ground-colour very pure and beautiful white, with bright carmine-scarlet feathering, deeply and boldly pencilled. MODESTY (Walker), ground-colour good white, with bright, light scarlet feathering, beautifully pencilled; flower medium; this variety is worthless in a flamed state. NANNY GIBSON (Hepworth), ground-colour nearly pure white, but the base of the young flowers has a yellowish tinge; distinct and peculiar tint of vermilion-scarlet feather; a very scarce variety; it is not of much value in the flamed state.

VI. Flamed Roses. AGLAIA, ground-colour good white; flame dark crimson-scarlet, with beam of light rose-pink; petals long; a very old and constant variety. ANNIE MCGREGOR (Martin), ground-colour and base pure white; flame intense scarlet, very bold; the best Flamed Rose. LUCRETIA (Syn. MADAME ST. ARNAUD) (Martin), ground-colour pure white, with bright scarlet flame. MABEL (Martin), finely flamed with scarlet and pink intermixed (MRS. LOMAX and PRETTY JANE are synonyms of this variety; they are merely different breaks from MABEL). MRS. LEA (Lea), ground-colour very pure white; extremely rare and distinct, and superior to all others in the rich blood-crimson flame; it is exquisite in the feathered state. TRIOMPHE ROYALE, ground-colour pure white, heavily flamed with dark crimson-scarlet; petals rather pointed; one of the oldest Tulips grown.

Single Early-flowering and Bedding Tulips. AMERICAN LAC, buff, with pale lilac and white feathering; novel and pretty. BIRD OF PARADISE, fine yellow, very large. BRIDE OF HAARLEM, carmine, with pure white feathering; very beautiful. DUCHESS OF PARMA, deep red, with deep orange-yellow border. GLADSTONE, carmine, large, well-formed. JAN LUIKEN, very pretty rosy-red, with yellow centre. JOOST VAN VONDEL, pure white; extra fine LAC BACKHUIS, lake, tipped white. LA GRANDEUR, vermilion; tall plant. MOUCHERON, crimson, large. OPHIR D'OR, deep yellow; very fine. QUEEN OF THE VIOLETS (Syn. PRESIDENT

Tulipa—*continued.*

LINCOLN), lilac-purple, flushed white at the margin. REMBRANDT, rich crimson, large; early.

Double Early-flowering and Bedding Tulips. AGNES, bright crimson-scarlet, large; early. BLANC BORDE POURPRE, violet-purple, white margin. DUC DE BORDEUX, orange-scarlet and yellow; fine. EPAULETTE D'OR, scarlet, with showy, gold feather. MARIAGE DE MA FILLE, white and crimson feather; fine. ROSE BLANCHE, pure white; very fine. VUURBAAK, rich, brilliant scarlet; fine.

URGINEA. To the species described on pp. 124-5, the following should now be added:

U. eriospermoides (Eriospermum-like). *fl.*, perianth oblong, ¼in. long, the segments whitish, with a broad, brown keel; raceme 1ft. long; peduncle slender, stiffly erect, 1ft. long. July. *l.* two, contemporary with the flowers, only one fully developed, cylindrical, glossy, ¼in. in diameter. Bulb ovoid, ½in. in diameter. 1887.

U. macrocentra (large-spurred). *fl.*, perianth ¼in. long, the segments white, tipped green; lowest bracts having a convolute, scariose spur ⅜in. to 1in. long; raceme dense, 5in. to 6in. long, 1in. in diameter; peduncle stout, erect, 2½ft. to 3ft. high. May. *l.* solitary, cylindrical, erect, 1½ft. long. 1887.

VALORADIA. A synonym of **Ceratostigma** (which *see*).

VANDA. To the species and varieties described on pp. 133-6, the following should now be added:

V. Amesiana (Ames'). *fl.* creamy-white, with a rich rosy hue mostly on the lip (which changes, when the flowers begin to fade, into light yellow), deliciously perfumed, thin and delicate in texture; sepals and petals cuneate-oblong, blunt-acute; side laciniæ of the lip small, nearly square, the middle one reniform, bilobed; spur conical, empty; inflorescence one to twelve-flowered. *l.* lorate, complicate. India, 1887.

V. Clarkei (Clarke's). *fl.* much as in *V. Cathcarti;* sepals and petals dark brown, barred ochre, yellow inside, cuneate-oblong, obtuse; lip whitish, marked brown, three-lobed, with a conical, acute spur, the front lobe cordate, oblong-elliptic, with a rough, lobulate border, and seven to nine whitish keels; the mouth of the spur covered by two retrorse crests, with another crest in front. Himalayas, 1886. SYN. *Esmeralda Clarkei.* The correct name of this species is *Arachnanthe Clarkei.*

V. Dearei (Deare's). *fl.* yellow; sepals and petals shortly stalked, elliptic, obtuse; lip with small, squarish side lobes, and a broad, transverse, pandurate front lobe, the conical spur having a short, rounded, grooved crest over the front of its mouth. Sunda Isles, 1886. Allied to *V. tricolor.*

V. Sanderiana albata (whitish). *fl.*, upper sepal and petals quite white, with a few purple dots at the base, the lateral sepals red-nerved; hypochil sulphur, striped brownish-purple, the anterior lacinia brownish-sulphur (sometimes purple-striped) at base. 1887.

VANILLA. To the species described on p. 137, the following should now be added:

V. Humblotii (Humblot's). *fl.* very large; sepals ligulate, acute; petals rhombic, broad, acuminate; lip rhombic, blunt-angled, undulated in front, with a dark, ribbon-like zone over the front part of the disk, and numerous strong, twisted hairs scattered from base to disk; raceme many-flowered. Africa (more definite information as to country not known), 1885. A leafless species.

VENIDIUM. To the species described on p. 141, the following should now be added:

V. fugax (fugacious). *fl.-heads* 1½in. in diameter; ray bright orange, a little paler beneath; disk blackish. *l.*, radical ones petiolate, elliptic, obtuse, sinuate, lobed, or sub-lyrate, generally without auricles; upper ones sessile, sometimes slightly auricled at base, entire or sinuate-toothed, the lower ones somewhat pandurate. *h.* 1½ft. 1887. Stem, leaves, and involucral scales shortly hairy.

V. hirsutum (hairy). *fl.-heads* 1½in. to 1¾in. in diameter; ray bright orange-yellow, but not so deep as in *V. fugax;* disk blackish. *l.* lyrate-pinnatifid; radical ones petiolate, with large, broadly elliptic-oblong, deeply lobed, terminal lobes, the petioles scarcely or not at all auricled; uppermost ones much smaller, sessile, pinnatifid. *h.* 10in. to 12in. Stem, leaves, and outer involucral scales hairy.

VERBENA. The very pretty garden varieties are not so much grown as they used to be, when bedding plants were more popular than at present; but they should find a place in every garden where there is a

Verbena—*continued.*

greenhouse to protect the plants from frost in winter. Several distinct varieties have quite recently been introduced to cultivation. The following is a select list:

AUGUST RENZ, reddish-pink, yellow eye; BALL OF FIRE, finest scarlet for bedding-out; BUTTERFLY, rosy-crimson, white eye; CARADOC, rich crimson-violet; CARMINATA RUBRA, red, striped deep crimson; CROIX DE HONNEUR, white, striped violet; DELICATA, pale rose, lilac flush, cream eye; DR. FEYERLIN, plum-purple and maroon, light centre; FAIRY QUEEN, blush-white, with ring of deep pink, inclosing yellow eye; FAUST, reddish-scarlet, of good form; F. DELAUX, scarlet and crimson, white eye; FLOWER OF DORSET, maroon-crimson, large truss; LA GRANDE BOULE DE NEIGE, fine, pure white; LORD LEIGH, rich scarlet, large and fine; MASTER R. CANNELL, lilac-purple, large pips and truss; MESANGE, bright red, with lighter shade, very large pips; M. MILLET, white, with stripes and spots of deep red; OPHELIA, rosy-pink, yellow eye; OTHELLO, crimson-maroon, lilac centre; STAR, rosy-pink, large white eye, large truss; STARS AND STRIPES, white, rosy-lilac stripes; SWANLEY GEM, white, with a pretty blue margin; URANIE, reddish-crimson, white eye, fine; VIOLACEA, silvery-violet.

VERONICA. To the species described on pp. 148-50, the following should now be added:

V. Armstrongi (Armstrong's). *fl.* whitish, in terminal, three to eight-flowered heads. *l.* minute, dimorphic, some long and acute, others broadly ovate and sub-acute, closely adpressed and coriaceous, adnate with the branches for half their length; margins faintly ciliate. *h.* 1ft. to 3ft. South Island, New Zealand, 1888. A much-branched shrub.

V. decumbens (decumbent). *fl.* white; corolla tube ¼in. long, much flattened on the inner side; racemes twelve to sixteen-flowered, shortly stalked, in pairs near the tips of the branches. *l.* entire, quite glabrous, very shortly stalked, ovate or lanceolate, obtuse, flat or slightly concave, not keeled, obscurely three-nerved, dull green, with bright red edges. Branches black and polished; branchlets pubescent. New Zealand, 1888. A small, very beautiful, decumbent shrub.

V. Hectori (Dr. Hector's). *fl.* pink and white, collected into an ovate, terminal head, with a villous rachis. *l.* closely, but not densely, imbricated, extremely thick and coriaceous, broader than long, broadly ovate or orbicular, very obtuse, nearly ⅛in. across, opposite pairs connate to the middle, puberulous along the edges, shining, not keeled. Branches, with the leaves on, obscurely tetragonous or terete. *h.* 6in. to 2ft. Southern Alps of Middle Island, New Zealand, 1888. A robust, small, much-branched shrub.

V. loganioides (Logania-like). *fl.* white, with pink stripes, very fugacious; calyx lobes lanceolate, acute, keeled, ciliated; corolla lobes broadly ovate; authers brown. *l.* densely imbricated, adpressed to the branches, ovate, acuminate, with spreading tips, usually entire, sometimes with one to three teeth on each side, ¼in. long, sessile, very sharply keeled below, glabrous except the ciliated margins. *h.* 6in. Rangetala Valley, New Zealand (5000ft. to 6000ft.), 1888. A small, evergreen shrub, decumbent and rooting at the joints.

VIBURNUM. To the species and varieties described on pp. 155-7, the following should now be added:

V. Sieboldii (Siebold's). *l.* opposite, dark green, flat, thick, coriaceous, oblong-oval, obscurely and bluntly serrated towards the apex. Japan.

VICIA. To the species described on p. 157, the following should now be added:

V. Denessiana (Dennes'). *fl.* varying in colour from pale brownish to violet-purple, 1in. long; standard shorter than the wings, which are somewhat reflexed above the middle; racemes as long as the leaves, dense-flowered. May. *l.* sessile; leaflets sixteen to twenty-four, alternate and nearly opposite, oblong, obtuse, mucronulate, silky-pubescent beneath. Azores. Perennial. (B. M. 6967.)

VITIS. To the species and varieties described on pp. 186-8, the following should now be added:

V. capensis (Cape). *fl.* tomentose, disposed in short cymes. *fr.* blackish-red, depressed-globose. *l.* reniform, obtuse-angled and sinuate-toothed. South Africa, 1887. Greenhouse trailer. (R. H. 1887, p. 372.)

V. japonica crassifolia (thick-leaved). *l.* large, very thick, coriaceous, three-lobed, bright green above, cobwebby-tomentose beneath. 1886.

WARREA. To the species described on p. 196, the following should now be added:

W. bidentata (two-toothed). *fl.*, lip longer and narrower than in *W. tricolor* and not so transverse, the keel at the base very sharp, the disk covered with seriate callosities.

W. cyanea (blue). A synonym of *Aganisia cyanea.*

WIKSTRŒMIA (named after J. E. Wikström, 1780-1856, a Swedish botanist). ORD. *Thymelæaceæ*. A genus comprising about twenty species of stove or greenhouse shrubs or trees, natives of tropical and Eastern Asia, Australia, and the Pacific Islands. Flowers shortly racemose or spicate at the tips of the branches; perianth having an elongated tube and four spreading lobes; stamens eight, included or shortly exserted. Leaves opposite or rarely alternate. *W. Alberti* is a greenhouse, deciduous, much-branched shrub, requiring similar culture to **Thymelæa** (which *see*, on p. 35). *W. viridiflora*—the bark of which yields a valuable paper material—is also in cultivation in botanical gardens. None of the species, however, are of any horticultural value.

W. Alberti (Albert's). *fl.* golden, capitate-umbellate; umbels pedunculate at the tips of the branches and branchlets. *l.* scattered or rarely nearly opposite, obversely lanceolate, or very rarely the uppermost ones linear-oblong, ½in. to 1½in. long, penninerved, rounded or rarely somewhat acute at apex. Branches glabrous, terete. *h.* 1ft. to 2ft. Bokhara, 1887. (R. G. 1262, under name of *Stellera Alberti*.)

WINDOW-BEARING ORCHID. *See* **Cryptophoranthus.**

XANTHOSOMA. To the species described on pp. 223-4, the following variety should now be added:

X. Lindeni magnificum (magnificent). A handsome variety, having much larger leaves than the type. 1885. SYN. *Phyllotœnium Lindeni magnificum*.

ZEA. To the species and varieties described on p. 238, the following should now be added:

Z. gigantea foliis-variegata (gigantic, variegated-leaved). *l.* variegated silver, white, and green, large, drooping. A beautiful plant.

ZINNIA. To the species and varieties described on p. 242, the following should now be added:

Z. linearis (linear). *fl.* bright golden-yellow, with a light orange margin, 1½in. to 2in. across, profusely produced. Summer. *l.* dark, narrow-linear. *h.* 1ft. Mexico, 1887. A neat, erect, dense bush. (G. C. ser. iii., vol. ii., p. 597.)

ZYGOCOLAX (a word made up from the generic names of the parent plants). ORD. *Orchideæ*. A name applied to a hybrid obtained by crossing *Colax jugosus* (male) and *Zygopetalum crinitum* (female), between which it is almost intermediate in shape. For culture, *see* **Zygopetalum,** on p. 245.

Z. Veitchii (Veitch's). *fl.* handsome, 2in. across; sepals and petals light greenish-yellow, blotched purple-brown; lip yellowish-white, longitudinally striated with violet-purple; scape a little shorter than the leaves, with a few sheathing, lanceolate, acute bracts. *l.* two or three, linear-lanceolate, 9in. to 12in. long, the basal ones a little broader and shorter than the upper ones. 1887.

ZYGOPETALUM. To the species described on pp. 245-8, the following should now be added:

Z. Crepauxi (Crepaux's). *fl.* showy, rather crowded; sepals and petals dark red, spotted and striped yellow; lip large, white, with violet lines on the margin, the nerves covered with short, violet-rose hairs. *l.* shortly stalked, elliptic-obovate. Pseudobulbs small, angular. Brazil, 1887. A robust, tufted, stove species.

Z. Ruckerianum (Rucker's). *fl.*, sepals and petals white, with a large, light purple area near the green base, twisting, undulated, acute; lip purple, with a white callus and some yellow at the base of the side lobes, revolute on each side, and rolled underneath at the top. 1885. Stove. Much in the way of *Z. Dayanum*.

Z. Wallisii (Wallis'). The correct name of the plant described on p. 161, Vol. I., as *Batemannia Wallisii*.

Z. W. major (greater). *fl.* 5½in. in diameter; sepals and petals white at base, chestnut-brown above, tessellated; petals striped deep purple at their lower extremities; lip chestnut-brown, reticulated, margined blackish-purple. Costa Rica. This giant variety requires to be kept constantly moist.

DATES OF PUBLICATION.

THE following are the dates on which the parts containing "New Introductions" have been published. The dates of issue of the body of the work will be found on pp. 249-50.

Abelia	to	Aster	September,	1888		Dieffenbachia	to	Odontoglossum	November,	1888
Aster	„	Dicksonia	October,	„		Odontoglossum	„	Zygopetalum	December,	„

THE END